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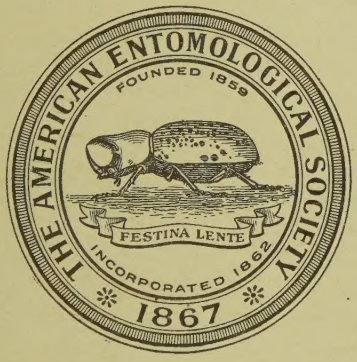

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RECORDS AND DESCRIPTIONS OF PYRGOMORPHINAE (ORTHOPTERA: ACRIDIDAE), WITH CRITICAL NOTES ON CERTAIN GENERA

BY JAMES A. G. REHN

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(Plates I to V)

The following observations and descriptions of new species and subspecies of Pyrgomorphinae [1] have been accumulating over a number of years, certain of the new forms having been worked out tentatively as much as thirty years past. It seems advisable at this time to make these latter, and the information here presented on distribution and variation in certain other genera, available to other workers.

The present study involves twelve genera and twenty-three species or subspecies, of which one subgenus and six species or subspecies are described as new. All of the types of the new forms are in the collection of the Academy except one, which is the property of the Museum of Comparative Zoology. All material reported without other indication is the property of the Academy of Natural Sciences of Philadelphia, while the ownership of other institutions is indicated by symbols based on the initial letters of their titles.

[1] At least tentatively I am continuing to use the classic subfamily name, until there is more certainty as to what should be used if it is to be replaced.

A total of four hundred and forty-five specimens is here recorded, and the known distribution of a number of species has been amplified or more definitely defined than was previously the case. In certain cases previously unpublished field observations have been recorded. A partial revision of the genus *Parapetasia* is also presented, while the first definite locality is given for the genus *Deraspiella.*

Rubellia nigro-signata Stål

1875. *R[ubellia] nigro-signata* Stål, Bihang K. Svenska Vetenskapsakad. Handl., 3, no. 14, p. 25. [♂, ♀; Madagascar.]

MADAGASCAR: Tananarive; II and III, 1918; (Lamberton); 4 ♂, 10 ♀, 1 juv. ♂. Ampefy, Itasy Province, Central Plateau; I and II, 1930; (Olsoufeiff); 5 ♂, 2 ♀. Mt. Ambasy, Itasy Province, Central Plateau; I, 1930; (Olsoufeiff); 1 ♀. Analamazotra, Great Eastern Forest; XII, 1930; (Olsoufeiff); 2 ♀. "Madagascar", no exact locality; (Lamberton); 3 ♂, 5 ♀. "Madagascar"; (P. Camboué); 1 ♀ (determined and labelled by Bolívar as "nigrosignata Stal"). "Madagascar" (ex Saussure); 1 ♀ (labelled as "Rubellia macroptera Bol." by Saussure).

The present author has already expressed his opinion[2] that *Rubellia* is a generalized member of the tribe Sphenariini, and not a component of the Poekilocerini, where it had been placed previously.

Of the above series of this alately dimorphic species one male from Ampefy and two "Madagascar" females, one of the latter received years ago from Saussure, represent the macropterous condition,[3] the remainder all being definitely brachypterous, although there is some variation in the proportionate length of the tegmina.

There is a very marked range in size in both sexes, and in several cases from the same locality. The two macropterous females which lack any data other than "Madagascar" are markedly different in size. As the only detailed measurements in the literature are those of I. Bolívar published in 1884, and of the male sex alone, the following extremes (in millimeters) of the present series may prove of interest.

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[2] Entom. News, LXII, p. 243 (1951).

[3] Named "form *macroptera*" by I. Bolívar (Bol. Soc. Españ. Hist. Nat., IV, p. 497 (1904)).

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
♂, Tananarive	26.5	6.8	7.1	14.6
♂, Tananarive	28.0	6.6	7.0	14.8
♂, Ampefy (macropterous)	20.8	5.2	19.8	11.7
♂, Ampefy	22.7	5.7	4.5	12.2
♂, Ampefy	27.0	7.0	6.0	14.0
♂, "Madagascar"	25.0	7.3	7.8	15.4
♀, Tananarive	29.5	7.3	6.8	13.3
♀, Tananarive	31.0	8.3	8.9	15.8
♀, Ampefy	25.2	7.3	8.1	13.3
♀, Ampefy	29.0	7.8	7.0	14.8
♀, Analamazotra	26.5	6.5	5.7	12.3
♀, "Madagascar" (macropterous)	24.2	6.3	17.0	12.0
♀, "Madagascar" (macropterous)	27.0	7.0	22.6	13.0

It is interesting to note that the macropterous individuals are of lesser bulk than the average of the more numerous brachypterous ones. Also their venation, both tegminal and alar, is of the generalized and rather primitive type usually seen in similar atavistic individuals in genera such as *Monistria, Podisma (pedestris), Dendrotettix, Chloealtis, Chrysochraon,* etc., which possess macropterous phases in normally brachypterous species. While there is a very considerable degree of variation in tegminal length in the brachypterous individuals, there is no indication of what has been called the mesopterous (or intermediate) condition, which is occasionally noted in species possessing the two extremes.

Saussure [4] has called attention to some of the color variants of this species. These may be said to evidence basic dichromatism of color tone, i.e. a green and a brown phase, the latter represented by the greater part of the present series. Some of the brown phase individuals approach buffy in the larger areas of solid color. Variation in the depth of the blackish fuscous pattern is considerable, also the extent to which the dorsum of the pronotum is sprinkled with the same tone, in the dorsal extent of the dark postocular bars on the prozona of the lateral lobes of the pronotum, and also that to which the latter impinges upon or largely suffuses the greater part of the metazona of the same lobes. In the green phase individuals the pronotal postocular bars are more restricted than in the majority of the brown phase representatives.

[4] Abhandl. Senckenb. Natur. Gesell., XXI, p. 643 (1899).

Prosphena scudderi I. Bolívar Plate I, figs. 1-4.

1884. *Prosphena scudderi* L. Bolívar, Ann. Soc. Españ. Hist. Nat., XIII, p. 447. [♂ (here selected as the lectotype), ♀ ; Guatemala.]

This genus and species were described from representatives of both sexes belonging to the S. H. Scudder Collection. In April, 1953 an examination of the Scudder material, now in the Museum of Comparative Zoology at Cambridge, Massachusetts, permitted me to designate as the lectotype the male of the original pair (M.C.Z. type no. 15061). Both specimens have been decolored by alcoholic or similar preservation, as originally suggested by Bolívar. The male has all of its limbs except the right caudal one and the left caudal tibia and tarsus. The female (allotype) has lost the right cephalic and caudal limbs, and there has been some damage to the left side limbs by insect pests (apparently far in the past). The type pair has been compared with representative material from the various lots here reported, and no differences of specific value were noted. The following records, almost entirely of previously unreported material, supply details on the distribution and periodicity of the species.

Guatemala: Sabanetas La Roja; 1 ♂, 2 ♀ ; [M.C.Z. and A.N.S.P.]. El Salvador: Izalco;[5] VIII, 21; (Fred. Knab) ; 1 ♂, 1 ♀ [U.S.N.M.]. Honduras: Minas de Oro;[6] VI, 1 (on one) ; (J. B. Edwards) ; 3 ♂, 2 ♀ ; [M.C.Z. and A.N.S.P.]. Tegucigalpa; X, 25, 1915; (F. J. Dyer) ; 1 ♂ ; [A.M.N.H.]. Rosario, San Juancito Mountains,[7] elevation 4800–6000 feet; VII, 10-31 and VIII, 13-18, 1930; (Honduras Expedition; J. A. G. Rehn) ; 2 ♂, 1 ♀, 11 juv. ♂, 16 juv. ♀, 20 very small juvs.; [A.N.S.P.]. Below Guacamayas, San Juancito Mountains, elevation 4100-4200 feet; VII, 27 and VIII, 15, 1930; (Honduras Expedition; J. A. G. Rehn) ; 4 juv. ♂, 3 juv. ♀ ; [A.N.S.P.]. Cantarranas,[8] Rio Choluteca, elevation 2200 feet; VII, 19-20 and VIII, 2-9, 1930; (Honduras Expedition; J. A. G. Rehn) ; 4 ♂,

[5] Near the south foot of the Volcan de Santa Ana and about four miles NE. of Sonsonate. Elevation, 1455 meters.

[6] In the Cerro Peñon, about 42 miles due S. of Lake Yojoa. Elevation, 1040 meters. Approximate position, 14° 42′ N., 87° 20′ W.

[7] A general description of the vicinity of Rosario and its biotic conditions will be found in the author's "A Naturalist in Honduras," published in the Bulletin of the Pan American Union for June, 1932.

[8] The official name for the community known locally as Cantarranas is San Juan de Flores.

7 ♀, 2 juv. ♂, 6 juv. ♀ ; [A.N.S.P.]. Portillo Grande;[9] IX, 2; (R. E. Stadelman) ; 1 ♂ ; [M.C.Z.]. NICARAGUA: Camoapa;[10] 1 ♀ ; [A.N.S.P.]. COSTA RICA: Ciruelas;[11] VIII, 15, 1915; (Anastasio Alfaro) ; 1 ♂ ; [A.N.S.P.]. Tarbaca;[12] XI, 1902; (C. F. Underwood) ; 1 ♂ ; [A.N.S.P.].[13]

In addition to the above material I have before me three males and two females, labelled " Cent. Amer. Rev. Th. Heyde ", which formed part of the Lawrence Bruner Collection and were listed by that author in the " Biologia Centrali-Americana "[14] as from Guatemala, although nothing attached to the specimens confirms this more exact allocation.

With the above series of more than thirty adult individuals, representing all of the Central American countries between Mexico and Panama, and eleven individual localities, it is evident the present species is one of great individual variability in size in both sexes. Also there is a considerable range in variation in the exact degree of production of the fastigium and its proportions, the exact shape of its margins in both sexes, and the degree and character of their serrulations in the male. Present series are not extensive enough to determine whether there is any correlation of these conditions with areas or elevations, but enough of a range is seen in material from the same localities, such as Cantarranas and Minas de Oro, to make doubtful any such correlation. In many respects *Prosphena* shows the same variational tendencies so strikingly exhibited by its close relative the Mexican genus *Sphenarium,* except that *Prosphena* does not show the marked polychromatism found in most of the forms of *Sphenarium.*

In the male sex of *Prosphena* the slip-like tegmina are always solidly infuscate, which tone, to an equal or somewhat lesser degree,

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[9] I am unable to place this locality, which, however, may be the following on the millionth map of Latin America (sheet ND 16) : El Portillo de la Jagua, near the Rio Quetis, about 27 miles NW. of Jutigalpa. Approximate position, 14° 50′ N., 86° 37′ W.

[10] Fifty-seven miles ENE. of Managua. Approximate position, 12° 25′ N., 85° 32′ W. Elevation, 560 meters.

[11] Or Las Ciruelas, well-known town, 6 miles WSW. of Alajuela.

[12] At road crossing of the Cerros de Escazú, 3 miles S. of Aserrí. Elevation, 1686 meters.

[13] Previously recorded by Rehn, Proc. Acad. Nat. Sci. Phila., 1905, p. 404 (1905).

[14] Orthoptera, II, p. 208 (1906).

generally colors the pronotal dorsum and the dorsum of the head. In the few exceptions the dorsum of the head and pronotum is of the general base greenish or greenish-yellow tone. This latter condition is most marked in the Ciruelas male and closely approximated in that from Portillo Grande. None of the females has any clearly evident infuscation of the dorsal surfaces.

Representative individuals from localities given above measure (in millimeters) as follows:

	Length of body	Length of fastigium cephalad of eyes	Length of pronotum	Greatest width of pronotum across lateral lobes	Length of tegmen	Length of caudal femur
♂, Sabanetas La Roja, Guatemala	22.0	1.95	5.7	6.0	3.7	11.8
♂, Izalco, El Salvador	27.0	2.6	7.3	7.1	4.5	14.8
♂, Minas de Oro, Honduras ..	17.0	1.63	5.3	4.5	2.9	10.5
♂, Minas de Oro, Honduras ..	27.8	2.4	7.6	7.6	5.0	16.4
♂, Tegucigalpa, Honduras	26.0	2.6	7.8	7.9	5.2	14.9
♂, Cantarranas, Honduras	16.5	1.46	4.2	4.4	2.9	9.6
♂, Cantarranas, Honduras	21.0	1.95	5.3	5.3	4.0	12.5
♂, Portillo Grande, Honduras	19.7	1.79	4.8	4.7	3.4	10.5
♂, Ciruelas, Costa Rica	24.8	2.6	7.1	7.1	4.5	15.6
♂, Tarbaca, Costa Rica	23.5	2.4	7.0	6.5	4.0	14.5
♀, Sabanetas La Roja, Guatemala	29.8	2.1	7.0	7.9	4.8	14.6
♀, Sabanetas La Roja, Guatemala	33.0	2.2	7.8	8.9	5.3	15.3
♀, Izalco, El Salvador	36.5	2.4	9.2	9.6	5.2	16.7
♀, Minas de Oro, Honduras .	31.5	2.1	7.8	8.6	4.8	15.3
♀, Cantarranas, Honduras	27.0	1.79	6.6	7.3	4.8	12.3
♀, Cantarranas, Honduras	30.0	2.2	7.9	9.4	4.8	15.4
♀, Camoapa, Nicaragua	40.5	2.9	10.2	11.5	5.7	18.7

The localities here listed include every exact one from which the species—and the genus—has to date been reported or from which it is known to me. All of these which can be located definitely are in the older mountainous areas of Central America, and none are in the humid eastern truly tropical belt or its ramifications up river valleys. I would assume from this that *Prosphena* is a relatively old member of the Central American fauna, probably well antedating the humid Pleistocene. In this it accords with my understanding of the history of the Sphenariini.

Where found the species is, from my experience, not a forest form, but occurs in open bush and in marginal forest tangles, but not within the forest itself. At Rosario on a number of occasions it was beaten from low bush along forest edge trail, and also taken on cut-over land, largely made by clearing the adjacent subtropical cloud forest. Below Guacamayas, a very small settlement on the north facing slope of the San Juancito Mountains below Rosario, immature *Prosphena* were taken in grassy areas between or under pine and oak stands, an environment strongly suggestive of much of Mexico, while at Cantarranas, at the foot of the San Juancito range, and in the more arid valley of the Pacific draining Rio Choluteca, it occurred only in weedy areas in the garden of a hacienda. The earliest date for an adult in the material before me is June 1, this on one male from Minas de Oro, Honduras. At Rosario, in a district where I spent approximately six weeks in 1930, the first adult was secured August 13, while at Cantarranas, but a few miles away but 2500 feet lower, the first adult was taken on August 4. The latest dates represented by adult material are October 25 (Tegucigalpa, Honduras) and November (Tarbaca, Costa Rica). Immature individuals were quite common at Rosario and Cantarranas during July and the first half of August, but adults were never numerous, and of those taken before our departure on August 18 a number were teneral, showing that the period of greatest adult frequence is later, probably late August and September. The immature individuals taken at Rosario represent a number of instars, and the same day's capture (July 13) included representatives of three distinct instars.

CAWENDIA Karsch

1888. *Cawendia* Karsch, Entom. Nachrichten, XIV, p. 343.

The genus *Cawendia* was described by Karsch on the basis of two species, one of which (*granulata* Karsch [16]) later (in 1896) by monotypy became the type of that author's genus *Stenoscepa,* while the remaining species (*glabrata*) was designated by Kirby in 1910 [17] as the genotype of *Cawendia.* This latter species was described from the Kawende district of the present Tanganyika Territory. To the genus subsequent to the beginning of the present century were added four species, i.e. *C. gallae* Rehn,[18] from Gallaland, which its describer subsequently removed to the genus *Parasphena,*[19] *C. aterrima* Ramme,[20] *C. grossa* of the same author,[21] and *C. vittata* Miller,[22] from the Transvaal.

For a matter of thirty or more years there has been in the collection of the Academy of Natural Sciences of Philadelphia material of both sexes of two species of the genus *Cawendia* from the Katanga Province of the Belgian Congo. Their tentative determination as undescribed species was worked out many years past, even before Ramme's species had been described. It seems desirable to amplify our knowledge by making these known.

The descriptions of *glabrata, aterrima* and *grossa* leave much to be desired in the way of comprehensiveness, as while they are relatively elaborate in regard to color, they are weak in information regarding important structural proportions. However, an analysis of the apparently diagnostic features of the previously known species show that both of those now before me are well distinct from those previously described. Both the new species differ from those

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[16] Entom. Nachrichten, XIV, p. 345 (1888). [♀, ♂; Kawende, German East Africa [= Tanganyika].]

[17] Synon. Catal. Orth., III, p. 320 (1910).

[18] Proc. Acad. Nat. Sci. Phila., 1901, p. 373 (1901). [♂; Sheikh Husein, Gallaland.]

[19] Proc. Acad. Nat. Sci. Phila., XCIV, p. 305, pl. 27, figs. 17 and 18 (1942).

[20] Mitt. Zool. Mus. Berlin, 15, p. 279, pl. IV, fig. 6 (1929). [♂; Mawambi [, Belgian Congo].]

[21] Mitt. Zool. Mus. Berlin, 15, p. 280, pl. IV, fig. 7 (1929). [♂; "Tanganyika."]

[22] Trans. Entom. Soc. London, LXXX, p. 37, figs. 18a and 18b (1932). [♀; Reitspruit, Marico, Transvaal.]

previously known in having the fastigium broader at the base than its median length cephalad of the eyes. The other features of difference from the previously known species are given in the individual diagnoses.

Cawendia hebardi[23] new species (Plate I, figs. 5-8.)

Compared with *C. glabrata, aterrima* and *grossa* this species, in addition to the fastigial feature already given, has narrower tegmina than in any of the three, while its size is distinctly less than that of *grossa,* and its color pattern differs markedly from that of *aterrima* or *grossa.* In the latter respect it is nearest *glabrata.* From *vittata* Miller it also differs in its distinctly larger size, in the subobsolete character of all postocular tubercles and their virtual absence from the ventral portion of the lateral lobes of the pronotum (especially in the female), in the proportionately longer metazona of the pronotum, the more shallowly emarginate median section of the caudal margin of the disk of the same, the much less produced ventro-caudal angle of the pronotal lateral lobes, in the broader and shorter tegmina, and in numerous details of the coloration.

Type.— ♂; Elisabethville, Katanga, Belgian Congo. March, 1921. [Academy of Natural Sciences of Philadelphia, Type no. 5773.]

Size medium (for the genus); general form elongate fusiform; surface of head, pronotum and pleura in part with numerous low welt-like strumulae and elsewhere impresso-punctate, abdomen, meso- and metanotum and venter much smoother.

Head with its exposed dorsal length equal to two-thirds that of the pronotum, evenly narrowing cephalad to the fastigium except for the eye outline; fastigium mitriformly subconical in outline as seen from the dorsum, its greatest proximal breadth equal to approximately 1.1 times the greatest fastigial length cephalad of the eyes, lateral outlines regularly and moderately converging cephalad to the distal third, whence they are inflexed more strongly to the rounded apex, median fissure reaching caudad virtually half of the dorsal length of the fastigium (as 14 to 30), lateral margins of fastigial dorsum distinctly cingulate, surface of fastigial dorsum caudad of median fissure, interocular space and cephalic portion of occiput with an appreciable

[23] In memory of the late Morgan Hebard, fellow-worker in both the laboratory and the field, to whom the Academy is indebted for the material of the here-described new species of this genus, as well as collections of tens of thousands of other Orthoptera from many parts of the world.

median carinula; interocular space somewhat less than the greatest basal breadth of the fastigium (as 9 to 11); fastigio-facial angle as seen in profile acute with the immediate apex very narrowly rounded, facial line strongly declivent; frontal costa well marked, extending from the fastigio-facial angle virtually to the supra-clypeal suture, narrow, sulcate throughout, the margins well carinate, becoming sublamellate dorsad of the median ocellus, parallel except for a slight expansion immediately dorsad of the antennal bases and contiguity at the fastigio-facial angle; genae with surface strumulae very low and not strongly marked. Eyes moderately prominent as seen from the dorsum, basal outline very broad ovate, but moderately deeper than broad (as 36 to 31). Antennae 2.1 times as long as the pronotal disk (as 85 to 39).

Pronotum as seen from dorsum with its general form subconcavely broadening caudad, the greatest caudal breadth across the lateral lobes contained 1.25 times in the length of the pronotal disk (as 31 to 39), dorsal line of pronotum straight as seen in profile; cephalic margin of disk arcuate, caudal margin of same transverse truncate, this rounded laterad into the caudal margins of the lateral lobes; median carina moderately evident, less pronounced on the prozona than on the metazona, no lateral carinae on the disk; dorsum with but two distinct transverse sulci, of which only the caudal (principal) intersects the median carina, prozona subequal to twice the length of the metazona (as 25 to 13), three transverse sulci evident on the lateral lobes, cephalic margin of latter oblique truncate, ventro-cephalic angle rounded obtuse, ventral margin of lobes moderately sinuate, more emarginate in cephalic half, ventro-caudal angle rather broadly rounded rectangulate, caudal margin subvertical briefly ventrad then obliquely subsigmoid dorsad to the junction with the caudal margin of the disk; surface of the lateral lobes with somewhat larger strumulae, often subcircular or ovate in outline, these more thickly placed ventrad, on the dorsum the surface is rather thickly impresso-punctate, on the metazona this condition is denser and finer. Metanotum without marked surface specialization, with little surface sculpture.

Tegmina lateral, narrow and very elongate elliptical in outline, their length subequal to seven-eighths that of the pronotum (as 35 to 39), their greatest breadth slightly less than two-fifths of their length (as 13 to 35); costal margin virtually straight in its proximal half, lightly arcuate thence to the rather narrowly rounded apex, sutural margin evenly arcuate throughout; areolation well impressed, humeral trunk with two marked subparallel and faintly arcuate components, anal vein next in emphasis, with the other longitudinal elements and the cross anastomosing nervures well evident.

Abdomen tapering caudad, the distal extremity moderately upcurved, no true dorsal medio-longitudinal carina indicated; ultimate tergite with the medio-dorsal section of its distal margin cut away broadly in a subtrapezoidal fashion, which exposes the basal portion of the supra-anal plate, the proximad-converging portions of which excision are thickened and somewhat rolled ventrad; supra-anal plate trigonal in outline, its greatest breadth subequal to its median length, its margins straight convergent distad to the narrowly rounded apex, its cross-section tectate with the medio-longitudinal

area pinched mesad, expanding proximad and there appreciably excavate and the more distal portion of this area deplanate and rugulose; cerci not surpassing the apex of the supra-anal plate, triangularly styliform in outline as seen in profile, their proximal depth equal to slightly more than five-eighths of their length (as 11 to 16), but very definitely compressed as seen from the dorsum; subgenital plate as seen in profile with its distal and ventral outlines forming a right angle with the immediate angle rounded, its dorsal margin tucked mesad under the supra-anal plate, while the lateral portions of the same margin as seen in profile are low arcuate, ventral medio-proximal diastema with membranous integument covering virtually two-thirds the length of the plate, the remainder of this surface (here dorsal in position) with an appreciable median carination.

Prosternal process erect, conically acute; mesosternal interspace very narrow, reverse cuneate in shape, its least breadth (at caudal third) slightly less than one-fourth of its length, mesosternal lobes subquadrate, slightly deeper than long, the caudal margins somewhat oblique and straight, the meso-caudal angle rather narrowly rounded; metasternal lobes narrowly separated caudad of the foveolae, the caudo-mesal margins of the same obliquely straight divergent to the produced rectangulate meso-caudal angle, caudal margin of the lobes rather strongly concave.

Cephalic and median limbs relatively short, femora moderately inflated. Caudal femora elongate, surpassing the recurved apex of the abdomen by a distance equal to the tegminal length, straight, slender, their greatest depth (at proximal fourth) equal to two-ninths of their length (as 20 to 90), internal face deplanate, external face well rounded in transverse section, longitudinal carinae well marked but not sharply or deeply emphasized, "herring-bone" pattern of pagina with the ventral section of each element more extensive, more prominent and more arcuate than the dorsal, genicular lobes distad subacute with immediate apex rounded; caudal tibiae slightly shorter than the femora, armed on the external margin with ten, on the internal with ten to thirteen spines, including the apical; caudal tarsi with equal claws, the arolium large and relatively elongate.

Allotype.— ♀; same data as type. [Academy of Natural Sciences of Philadelphia.]

Differing from the above description of the male sex in the following noteworthy respects.

Size as usual larger than in the male; form similarly somewhat more robust; surface with the welt-like strumulae more evident on the meso- and metanota and on the abdominal dorsum than in the male.

Head with its exposed dorsal length but half that of the pronotum, in form less regularly produced and broader than in the male; fastigium broad, more trigonal and less mitriform in outline as seen from the dorsum, its greatest proximal breadth equal to slightly more than 1.25 times the fastigial length cephalad of the eyes, lateral outlines straight convergent distad in proximal

half, thence rounding to the apex, median fissure reaching caudad for four-elevenths of the dorsal length of the fastigium, thus faintly less extensive caudad than in the male, lateral margins of fastigial dorsum less strongly cingulate than in the male, medio-longitudinal carina as in the male; interocular space broader than in the male, this, however, proportionately but slight, being equal to eleven-fourteenths of the greatest breadth of the fastigium; fastigio-facial angle as seen in profile slightly less acute than in the male, facial line somewhat less strongly declivent; frontal costa as in male but less strongly lamellate dorsad. Eyes as in male. Antennae one and two-thirds times as long as the pronotal disk (as 82 to 50).

Pronotum with general form and proportions much as in male; margins of the disk as in the male except that the caudal one is very faintly and very shallowly emaginate mesad; median carina about equally marked throughout, transverse sulci of dorsum as in male, metazona of disk slightly longer, equal to three-fifths of the prozonal length (as 10 to 30); lateral lobes slightly shorter and deeper in proportion than in the male, the greatest depth somewhat less than half of the dorsal length of the lobes in the usual position of lateral carinae (as 26 to 48), margins of lateral lobes as in male. Metanotum with a distinct medio-longitudinal carination, this continued upon the abdomen and quite decided on the proximal abdominal tergite.

Tegmina lateral in position as in the male, slightly shorter in proportion to the pronotal length, i.e. equal to approximately four-fifths of the latter (as 36 to 50), reaching as far caudad over the abdomen, but with their breadth proportionately greater and equal to half the tegminal length (as 18 to 36), the general outline more nearly broad-elliptical; costal margin in proximal third faintly low concave, thence distad evenly arcuate to the well-rounded apex, sutural margin broadly arcuate throughout, humeral trunk and areolation as in male, but anal vein less clearly evident.

Distal abdominal tergite deeply V-emarginate mesad, the tergite almost bisected on the median line, the oblique meso-lateral sections of the tergite with their surface decurving meso-ventrad from the plane of the lateral surfaces; supra-anal plate with the margins of its free portion converging to the sub-acute angulate apex, in lateral aspect its dorsal outline is very slightly decurving at apex, in transverse section the plate is subdeplanate meso-dorsad, rather sharply declivent proximo-laterad, transverse division of plate marked, arcuate mesad and there situated at one-third of length of plate, its lateral sections straight oblique and directed latero-caudad; ovipositor valves relatively broad and stout, the dorsal ones with their dorsal surface strongly concavo-excavate, the external margins not dentate but faintly and irregularly notched, ventral valves with the ventro-lateral tooth marked, lamellate, and well cut off from the rather narrow decurving distal tooth, lateral plates trigonally produced distad, apices acute, ventral margin straight, dorsal margin straight oblique in distal half; subgenital plate relatively broad, subquadrate, broadly U-shaped in transverse section, distal margin very shallowly bisemarginate with the median intervalvar production acute styliform.

Mesosternal interspace in general pattern as in male, but distinctly broader, its least width (caudad) equal to but slightly less than three-fifths of its length (as 22 to 38), mesosternal lobes essentially as in male; metasternal lobes separated by an interspace roughly subequal to that between the mesosternal lobes.[24]

Cephalic and median limbs faintly longer in proportion than in the male, much more slender and femora not at all inflated. Caudal femora with their apices rather narrowly surpassing the apices of the ovipositor valves, faintly more slender than in the male, the greatest depth equal to somewhat less than one-sixth of the femoral length (as 18 to 114), as seen from the dorsum slightly more compressed than in the male with the external face rather more deplanate; caudal tibiae with nine to ten external and twelve to thirteen internal spines, including the apical.

Measurements (in millimeters)

	Length of body	Length of antenna	Length of pronotum	Greatest width of pronotum	Length of tegmen	Length of caudal femur
♂, Elisabethville, Belgian Congo, *type*	22.5	13.8	6.3	5.0	5.7	14.6
♂, Elisabethville, Belgian Congo, *paratype*	23.0	...*	5.7	4.4	4.8	13.2
♀, Elisabethville. Belgian Congo, *allotype*	31.0	13.3	8.1	6.6	5.8	18.5
♀, Elisabethville, Belgian Congo, *paratype*	27.8	...*	7.4	6.0	5.3	15.3

* Incomplete.

Coloration.—General pale base tone ranging from as light as lime green to as dark as light yellowish-olive, the overlying darker pattern from as light as buffy olive to as dark as dark olive. The dark pattern is generally made up of a medio-longitudinal bar extending from the fastigium to the base of (but not on) the supra-anal plate, with much broader postocular bars which cover most of the genae, all of the lateral lobes except the immediately ventral pale section, and also evident as lateral bars over most of the sides of the abdomen, becoming obsolete distad, and on the abdomen usually less evident in the female. The alternation of light and dark longitudinal areas is more decided and striking in some individuals than in others. The medio-longitudinal dark bar often is divided by a fine pale line, which when present may extend from the pronotum almost to the apex of the abdomen, also the paired dark dorsal bars, and particularly on the abdomen, are dotted with

[24] This area is damaged in the allotype and the above comment has been drawn from female paratypic material.

pale puncta, these latter usually grouped symmetrically and on the abdomen generally as two pairs to a tergite. Eyes ranging from as pale as cinnamon-buff to as dark as sayal brown. Antennae, except for the rather pale proximal article, ranging from snuff brown to bister. Face and mouth-parts largely of the darker tone, numerous of the low pustulae scattered over these areas, as well as on similarly toned sections of the lateral lobes and pleura, touched with the paler tone and thus moderately contrasted; tegmina generally as a whole of the darker tone, occasionally somewhat paler, rarely (in the type alone) the anal area is definitely paler and somewhat contrasted with the remainder of the tegmina. Caudal femora usually more olivaceous than the base pale tone, dorsal surfaces, except for the genicular extremities, sometimes lightly washed with pinkish, external surface usually, but not always, paling ventrad to mustard yellow; caudal tibiae ranging from light coral red to deep brownish vinaceous, spines cream buff at base, black tipped.

The type is deeper in color tones than any other individual of the species which I have seen. The allotype is intermediate between the extremes of the color range seen in the female sex.

Paratypes.—I am indicating as paratypes all of the material of the species other than the type and allotype now before me, these being four of each sex. All are from the type locality, with the capture dates March and April, 1921, and one specifically April 6, 1921.

Remarks.—The considerable range in coloration, and particularly in the male sex, at first glance gives to the extremes of this species a rather different appearance, which, however, becomes less marked as the whole series is examined.

Cawendia kibara[25] new species (Plate I, figs. 9-12.)

This species is somewhat larger than *C. hebardi,* and in addition the female is also more elongate than in that species, the fastigium has its apex blunter in both sexes and its form less trigonal as seen from the dorsum, the metanotum in both sexes has a distinct mediocaudal moderately elevated and subtrigonal process, which is lacking in *hebardi,* details of the external genitalia of the male also differ, and as a whole the body sculpture is distinctly less rugulose, while the color pattern differs in the pale blotching of the lateral lobes of the pronotum, of the pleura and of the genal region of the head, as contrasted with the more numerous smaller touchings of various low tuberculations of the same areas seen in *C. hebardi.*

[25] After the Kibara Mountains, on or near which this species was taken.

General differences of *glabrata, aterrima* and *grossa* have already been given under *hebardi,* to which they are equally applicable. The present species is also definitely smaller than *grossa,* has a different coloration from *aterrima,* and from both of these and *glabrata* it is further distinguishable by its narrower tegmina, and presumably by the metanotal development. From *vittata* the present species differs also in its larger size, apparently more slender form, smoother genae and ventral portion of the lateral lobes of the pronotum, broader and proportionately shorter tegmina, and quite different coloration.

Type.— ♂ ; Hill 30 miles east of Lake Kisale,[26] Katanga, Belgian Congo. Elevation, 2900 feet. (Mrs. H. M. Springer.) [Academy of Natural Sciences of Philadelphia, Type no. 5774.]

Size larger than the same sex of *hebardi*; form slightly more attenuate than in the latter; surface with much fewer, lower and less evident strumulae, while the areas which bear impressed punctulae have the same somewhat finer and not as coarsely etched.

Head with its exposed dorsal length approximately equal to two-thirds that of the pronotum (as 27 to 42), its general outline as seen from the dorsum, except for eye outlines, slightly more pyramidical than in *hebardi*; fastigium narrower than in *hebardi,* its converging lateral margins subsinuate, its apex arcuately subtruncate, the greatest proximal breadth of the fastigium subequal to its median length, median fissure reaching caudad to middle of fastigium, median carinula of caudal half of fastigium, interocular space and occiput evident but broken in continuity; interocular space equal in breadth to four-fifths that of the fastigial base (as 8 to 10) ; fastigio-facial angle as seen in profile slightly more acute than in *hebardi,* with the immediate angle even more narrowly rounded, facial line as in *hebardi;* frontal costa as in *hebardi* but slightly narrower; genae with surface strumulae fewer than in the male of *hebardi* and individually of larger surface area. Eyes as seen from the dorsum slightly less prominent laterad than in *hebardi,* basal outline slightly more ovate than in *hebardi,* appreciably deeper than broad (as 41 to 32). Antennae faintly more than twice as long as the pronotal disk (as 88 to 42).

Pronotum as seen from the dorsum very similar to that of the male of *hebardi* except that it is slightly broader proportionately across the caudal sections of the lateral lobes, this dimension contained 1.21, instead of 1.25, times in the median length of the pronotum; cephalic and caudal margins of

[26] This locality and elevation apparently indicates the lower slopes of the Kibara Mountains east of Lake Kisale, which latter forms the junction point of the Lualaba and Lufira Rivers in eastern Katanga Province. Approximate position of locality 8° 30′ S., 27° E.

the disk as in *hebardi*; median carina well marked, much more elevated than in *hebardi*, clearly cut by the second and third (principal) transverse sulci, the former of which has its sinuosity more marked on the dorsum than in the male of *hebardi*, proportions of prozona and metazona on dorsum as in *hebardi*; lateral lobes of the pronotum slightly deeper proportionately than in the male of *hebardi*, their greatest depth mesad contained but 1.8 times in their dorsal length at the usual position of lateral carinae of the disk (as 22 to 40), margins of the lateral lobes as in *hebardi* except the caudal one is less distinctly subsigmoid, surface of lateral lobes with relatively few and definitely larger, but low, strumulae when compared with those of the male of *hebardi*, those in the pale ventral area more or less fused into a thickened subglabrous section, impresso-punctations of the lateral lobes somewhat finer than in *hebardi*, which is also true, but less definitely so, of those of the dorsum of the pronotum. Metanotum and more proximal abdominal tergites with a fine medio-longitudinal carinula, this becoming obsolete caudad on the abdomen, but on the proximal abdominal tergite more evident and elevated caudad into a produced acute process.

Tegmina in general as in the male of *hebardi*, but slightly broader, their greatest breadth equal to virtually two-fifths of their length (as 15 to 38), their apices reaching to the proximal part of the second abdominal tergite, margins and venation as in the same sex of *hebardi*.

General form of abdomen much as in the male of *hebardi* but the apex is less recurved; ultimate tergite with the emargination of the distal margin much as in *hebardi* but the lateral sections of it are less thickened; supra-anal plate with proportions and outline as in the male of *hebardi*, surface more deplanate and with its median area lanceolate in outline and broadly and shallowly impressed at base, and larger in extent than in *hebardi*, lateral sections of plate weakly declivent; cerci as in the male of *hebardi*; subgenital plate much as in that sex of *hebardi* but with the dorso-lateral margins appreciably more declivent ventro-cephalad toward the base, sides of the plate slightly less flattened as seen from the dorsum.

Prosternal process conical, but shorter and stouter than in the male of *hebardi*, its cephalic face more appreciably concave proximad; mesosternal interspace more hour-glass shaped than in the male of *hebardi*, its least breadth mesad equal to one-fourth of its depth (as 7 to 28), mesosternal lobes less subquadrate in outline than in *hebardi*, the narrowly rounded meso-caudal angles more produced caudad, the caudal angles in consequence more oblique; metasternal lobes even more narrowly separated caudad of the foveolae than in *hebardi*, while the lobes themselves are very similar in outline.

Cephalic and median limbs slightly longer proportionately and with the femora somewhat less inflated than in the male of *hebardi*. Caudal femora surpassing the apex of the abdomen by a distance slightly less than the tegminal length (as 33 to 38), in general form as in the same sex of *hebardi*, their greatest depth at proximal fourth equal to slightly more than one-sixth of their length (as 19 to 103), carination and sculpture essentially as

in the male of *hebardi*; caudal tibiae slightly shorter than the femora, armed on the external margin with ten, on the internal margin with twelve to thirteen spines, including the apical one; caudal tarsi as in *hebardi*.

Allotype.— ♀; same data as type. [Academy of Natural Sciences of Philadelphia.]

Differing from the above description of the male sex, and that of the female of the related *C. hebardi*, in the following noteworthy respects.

Size somewhat larger than the male; general form very similar to that of the female of *hebardi*; surface as a whole somewhat smoother than that of the same sex of *hebardi*, particularly of the abdomen and the dorsum of the head and of the prozona of the pronotum.

Head with its proportionate dorsal length as in the female of *hebardi*; fastigium less definitely trigonal than in this sex of *hebardi*, more as in the male of this species, the lateral portions of the margins in part less oblique, its greatest proximal breadth equal to 1.3 times its length cephalad of the eyes, median fissure reaching caudad for half the length of the fastigium, in transverse section the fastigial dorsal surface is more subtectate than in the female of *hebardi*, medio-longitudinal carinula evident but less definite caudad on the occiput; interocular space subequal to the fastigial length; fastigio-facial angle as seen in profile much as in the male, somewhat sharper than in the female of *hebardi*, retreating facial line faintly concave, angle of obliquity as in the male; frontal costa essentially as in male, more pronounced than in the female of *hebardi*. Eyes in basal outline faintly more ovate than in the male, the greatest breadth of the same equal to five-sevenths of the length.

Pronotum more longitudinal and extensive caudad than in the male sex, and even more so than in the female of *hebardi*, greatest breadth caudad across the lateral lobes contained about 1.25 times in the pronotal length (as 43 to 55), in outline as seen from the dorsum more regularly broadening caudad; cephalic margin of disk as strongly arcuate as in the male sex, caudal margin of same broadly and shallowly emarginate mesad, the paired lateral sections of this margin low convex-arcuate; median carina distinct but low, in its greater portion finely divided medio-longitudinally by a very fine sulcation, distinctly cut only by the principal transverse sulcus, no true lateral carinae present, length of metazona equal to seven-tenths that of prozona (as 25 to 35), surface of dorsum of pronotum smoother than in the male or in both sexes of *hebardi*, the impresso-punctations more rounded, less sharply cut and the whole relatively glabrous, the sculpture of the metazona finer and more stipple-like than on the prozona; lateral lobes much as in male but slightly more longitudinal, the greatest depth measured dorsad of the ventro-caudal angle contained virtually 1.9 times in their dorsal length at the usual position of lateral carinae of the disk (as 27 to 51), disposition of sculpture of the lateral lobes as in the male but the whole is somewhat

less rugged and more glabrous in the smoother areas. Metanotum and more proximal abdominal tergites with the medio-dorsal carina even more evident than in the male, the metanotal caudal production as evident as in the male.

Tegmina as in the male but slightly broader proportionately, the width but slightly less than half the length (as 18 to 38), margins and venation as in the male.

Abdomen with the medio-longitudinal carination of the more proximal tergites more sharply marked and narrower than in the female of *hebardi*, their tectation more pronounced, ultimate tergite with its emargination as in the female of *hebardi*, but the oblique meso-lateral sections have their surface more deplanate and not definitely decurving meso-ventrad; supra-anal plate essentially as in the female of *hebardi*, but its distad converging lateral margins are straighter, the apex is more sharply acute and less decurved; dorsal ovipositor valves shorter and thicker than in the female of *hebardi*, dorsal concavity of their surface less sharply cut off from the lateral faces by the less decidedly lamellate dorso-lateral margins, the distal tooth thicker, less sharply upcurved and less incisoriform than in *hebardi*, the lateral surfaces more bullate ventro-laterad of the dorso-lateral margins than in *hebardi*, ventral ovipositor valves much as in latter but narrower and the ventro-lateral tooth is not as pronounced and the distal one more slender in ventral aspect and not as flattened ventrad, while the whole ventral concavity of the two ventral valves is less broadly excavated, lateral plates slightly narrower than in *hebardi*, dorsal margin of same with its proximal arcuation somewhat lower than in the other species; subgenital plate with its distal margin in general subtruncate except for the spiniform inter-valvar process, the actual margin with micro-erosulate points scattered over it.

Mesosternal interspace broader than in the male, but narrowing mesad by the arcuation of the internal margins of the lobes, least breadth (mesad) equal to two-thirds of the greatest length of the interspace, mesosternal lobes with subequal depth and greatest breadth, but with the obliquity of the caudal margins less pronounced than in the male of the species; metasternal lobes separated by an interspace slightly greater than that between the mesosternal lobes.

Cephalic and median limbs much more slender than in the male with the femora not at all inflated. Caudal femora with their apices but slightly surpassing the apices of the ovipositor valves, somewhat more slender than in the male, their greatest depth contained 6.3 times in their length (as 18 to 114), carination and sculpture as in male sex; caudal tibiae slightly shorter than the femora, armed as in the male.

Measurements (in millimeters)

	Length of body	Length of antenna	Length of pronotum	Greatest width of pronotum	Length of tegmen	Length of caudal femur
♂, Hill 30 miles E. of Lake Kisale, Belg. Congo, *type*	26.5	14.3	6.8	5.6	6.1	16.7
♂, Hill 30 miles E. of Lake Kisale, Belg. Congo, *paratype*	29.0	...[26]	7.1	6.0	7.3	16.4
♀, Hill 30 miles E. of Lake Kisale, Belg. Congo, *allotype*	32.8	14.6	8.9	7.0	6.1	18.5
♀, Hill 30 miles E. of Lake Kisale, Belg. Congo, *paratype*	37.5	...[26]	8.3	6.6	7.3	18.9

Coloration.—The color pattern of *kibara* is more striking than that of *hebardi*, in general the dorsal surface having well-defined paired pale bars which reach from the interocular area of the head to the supra-anal plate, where they join, leaving an enclosed medio-longitudinal darker bar, which in turn has a more or less distinct median pale pencilling extending from the pronotum to the penultimate abdominal tergite, while pale oblique infra-ocular bars cross the genae and the ventral portion of the lateral lobes of the pronotum, becoming broken and tessellate with the darker tone on the pleura. The basic pale tone ranges from light ochraceous-buff to citron yellow, while the darker tone varies from as light as buffy citrine to as deep as dark greenish-olive. Head with face and most of cephalic section of genae dark, the lateral facial carinae and those of the frontal costa pencilled with the pale tone as well as a number of low pustulae on the face; eyes ochraceous-tawny to dull citrine, often with a cupreous tinge; antennae coral red to brick red. Pronotum with the paired dorsal pale bars regularly broadening caudad, those near the caudal margin of the disk sometimes with a short enclosed median dark line; lateral lobes with the dark bars, which cover their dorsal two-thirds, enclosing a number of small pale maculae, which are even more pronounced and disruptive on the pleura, while on the sides of the abdomen the dark bars enclose many similar small pale maculae. Tegmina ranging from completely pale to slightly darker in the costal and discoidal areas, the anal always pale. Ovipositor valves ranging from pinkish cinnamon to dull orange, the margins fuscous edged, the tips similarly colored. Base color of the cephalic and median limbs as a whole ranging from clay color to snuff brown; caudal femora with their dorsal surfaces washed with cinnamon to pale zinc orange, rarely more greenish,

[26] Incomplete.

external face meso-longitudinally buffy olive, this occasionally paling to isabelline, ventrad this face is longitudinally barred with cream-buff to deep colonial buff, ventro-external face terra cotta to pecan brown, ventro-internal and internal faces buffy to pale ferruginous; caudal tibiae orange-vinaceous to russet-vinaceous, spine buffy whitish, dark tipped.

Paratypes.—I regard all the material now before me in addition to the type and allotype as paratypic. This consists of one male and five females bearing the same data as the type and allotype.

Comoensia insignis I. Bolívar

1881. *Camoensia insignis* I. Bolívar, Jorn. Sci. Math. Phys. Nat. Acad. R. Sciencias, Lisboa, VIII, p. 111. [♀;[27] Humbe and Quango, Angola; Angola.]

ANGOLA: Benguella; 1 ♂. Caconda; 1 ♂. Palavange;[28] XI, 2, 1930; (Second Prentice Gray African Expedition, H. T. Green); 1 ♂, 2 ♀.

Exact records of this genus and species are very few and material presumably scarce in collections. Measurements given in the literature indicate that the species is exceedingly variable in size. The Benguella and Caconda males here recorded are much more deeply sculptured and more rugosely strumose than the Palavange individuals, and presumably represent Bolívar's variety *sculpturata.*[29] The Palavange male has the tegmina narrower than in the females from the same locality or the males from Benguella and Caconda, which have them as shown in Bolívar's 1884 figure,[30] which was drawn from a female specimen.

Maura bolivari Kirby (Plate III, figs. 27 and 28.)

1902. *Maura bolivari* Kirby, Trans. Entom. Soc. London, 1902, p. 87. [♀; Fort Johnston and Zomba, Nyasaland.]

NYASALAND: Limbe; (Mrs. H. V. Wise); 1 ♀.

This specimen fully agrees, except for somewhat smaller size, with one of the same sex from Balaka Road, Ncheu, Nyasaland,

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[27] Apparently the sex mark used to indicate a male in the original description is that of the female sex inverted, as Bolívar in 1890 (Jorn. Sci. Math. Phys. Nat. Acad. R. Sciencias, Lisboa (2) I, p. 173) states that the measurements then given for the male are the first for that sex, which indicates that the original description was based on the female sex.

[28] Palavange is located between the Cuanza and Luanda rivers, about seventy miles north of Silva Porto, at an elevation of 4500 feet.

[29] Boletín Soc. Españ. Hist. Nat., IV, p. 308 (1904). [♀; "West Africa".]

[30] Anales Soc. Españ. Hist. Nat., XIII, p. 4, fig. 29.

taken by Dr. J. E. S. Old, and received in exchange from the British Museum (Natural History), the latter determined by Uvarov, probably after comparison with Kirby's type material.

Maura modesta I. Bolívar

1904. *M[aura] modesta* I. Bolívar, Boletín R. Soc. Españ. Hist. Nat. IV, pp. 319, 322. [♀; German East Africa [= Tanganyika Territory].]

Tanganyika Territory: Turiani;[31] XII, 1922; (A. Loveridge); ♀; [M.C.Z.].

This specimen fully agrees with Bolívar's short but very definite description. As to his comment that it might be a "variety" of *M. bolivari,* I would say, with both before me, that while they are clearly derivatives of the same line of the genus, *modesta* is a fully distinct species, with shorter and deeper caudal femora, which also have thicker carinae, and further a distinctive tegminal development, the greater expansion of the anal area being unusual, while numerous colorational features are different.

Miller[32] has redescribed this species, given a good figure of it, and reported it from Ilong (Kilosa) and from between Uliya and Kidete, Tanganyika. The specimen before me has the limbs as a whole more mottled wood brown and less blackish than as described by Miller.

Maura lurida (Fabricius)

1781. [*Gryllus*] *luridus* Fabricius, Spec. Ins., I, p. 366. [♀; "Equinoctial Africa".]

Kenya Colony: Guaso Nyiro; VII, 12 [1909]; (Glover M. Allen and G. Brooks); 1 ♀; [M.C.Z.].

The specimen from Dumbola Kalta, country of the Boran, east of Lake Stephanie, western Gallaland,[33] southern Abyssinia, recorded years ago by me as *Taphronota thaelephora*[34] represents

[31] Turiani is between Kilosa and Kimambe, according to information supplied by Mr. Loveridge. The elevation is somewhere in the neighborhood of 1600 feet.

[32] Trans. Entom. Soc. London, LXXVII, p. 78, pl. VII, fig. 14 (1929).

[33] The position of this locality is 5° N., and very slightly east of 38° E. See map facing page 236, in A. Donaldson Smith's "Through Unknown African Countries", 1897.

[34] Proc. Acad. Nat. Sci. Phila., 1901, p. 375 (1901).

the present species, which was long known as *Maura apicalis* Bolívar.[35] It is probable that certain of the past records of *apicalis* do not relate to this species, which, however, seems to range broadly from the Red Sea coast at Massaua westward to the Guinea coast. The present records, however, appear to be the most southern for the species in eastern Africa.

PARAPETASIA I. Bolívar

1884. *Parapetasia* I. Bolívar, Anales Soc. Españ. Hist. Nat., XIII, pp. 25, 485.

Genotype (by monotypy): *P. femorata* I. Bolívar.

With a series of over fifty specimens of the genus before me it is evident that *Parapetasia* comprises two quite distinct subgeneric units. These may be distinguished as follows:

Pronotum deeply and concavely sellate meso-dorsad, caudal section of the metazonal disk bulbously inflated dorsad, its caudal margin emarginate mesad. Tegmina represented only by rudimentary lobes.
Parapetasia s. s.

Pronotum not deeply and concavely sellate meso-dorsad, caudal section of the metazonal disk not bulbously inflated dorsad, its caudal margin not emarginate mesad. Tegmina in both sexes subequal in length to the pronotum. ..... **Loveridgea** new subgenus.

These two entities are largely complementary to one another in distribution, true *Parapetasia* being confined to lowland West African forest districts from the Gaboon to southern Nigeria, while *Loveridgea* is typically East African, with, however, one species found in elevated areas in the Cameroons highlands of western Africa (see discussion under that subgenus).

Parapetasia s. s.

In addition to the features given in the preceding key for the separation of restricted *Parapetasia* from the subgenus *Loveridgea,* it may be noted that in the former the outline of the fastigium as seen from the dorsum, and in both sexes, is trigonal, and not semiovate as in *Loveridgea,* that the tuberculations and strumae of the pronotum are not as clearly arranged in longitudinally linear series, and there are no marked and cephalad descending lateral carinae made up of contiguous strumose tubercles on the prozonal lateral

[35] See Uvarov, Trans. Entom. Soc. London, 1924, p. 281 (1924). This synonymy was established after study of the Fabrician type.

lobes, those tubercles which are present being separate and not cariniform in their disposition.

The restricted subgenus contains two species, the genotype *P. femorata* I. Bolívar and the here-described *P. càlabarica.*

The two species of this subgenus may, in the female sex, be distinguished by the following features:

Form more robust and stockier. Eyes more prominent as seen from the dorsum. Greatest breadth of pronotum across lateral lobes more nearly subequal to the medio-dorsal length of the pronotum. Tegmina exceedingly small, not extending as far caudad as the caudal margin of the pronotum. (Gaboon and lowland Cameroons.) ....**femorata** I. Bolívar

Form more slender and attenuate. Eyes less prominent as seen from the dorsum. Greatest breadth of pronotum across lateral lobes equal to but four-fifths of the medio-dorsal length of the pronotum. Tegmina more lobately developed, extending slightly caudad of the caudal margin of the pronotum. (Southern Nigeria.) .....**calabarica** new species

Parapetasia (Parapetasia) femorata I. Bolívar (Plate II, figs. 13-16.)

1884. *Parapetasia femorata* I. Bolívar, Anales Soc. Españ. Hist. Nat., XIII, p. 485, pl. IV, figs. 28, 28a-c. [♀; Gaboon.]

Cameroons: Elat; XII, 1926; (A. I. Good); 1 ♀; [Carnegie Mus.]. Lolodorf; IX, X, 1, XI, 30, 1926; (A. I. Good); 3 ♂, 6 ♀, 1 juv. ♀; [Carnegie Mus. and A.N.S.P.]. Efulen; (J. A. Reis); 1 ♀; [Carnegie Mus.]. Ebolowa; I, 11, X 3, XII, 9 and 11, 1931, and I, 25, 1932; (H. C. Wing); 1 ♂, 4 ♀; [A.N.S.P.]. Bitje, Ja River; IV, 1909 (Rainy season), VI-VII, 1909 (Dry season), IV-VI, 1910; (Bates); 10 ♂, 4 ♀, 1 juv. ♂; [A.N.S.P.]. "Kamerun"; 2 ♂, 1 ♀; [A.N.S.P.].

The above series exhibits an appreciable amount of variation in size in both sexes, some in the degree of inflation of the metazonal portion of the pronotal disk, and rather less in the similar development of the cephalic portion of the same. The position and degree of emphasis of the various pronotal tuberculations show but minor variations.

Adult individuals show the following extremes in size (in millimeters) at several of the localities:

	Length of body	Length of pronotum	Greatest breadth of pronotum across lateral lobes caudad	Length of caudal femur
♂, Bitje	33.0	10.5	9.2	15.1
♂, Bitje	36.8	10.7	9.7	16.9
♂, Ebolowa	41.8	11.0	10.4	17.2
♀, Bitje	47.0	14.8	13.3	20.5
♀, Bitje	52.0	15.4	14.0	23.6
♀, Ebolowa	53.0	15.3	14.1	22.8
♀, Ebolowa	57.0	16.7	15.9	23.7

It is evident there is a greater average bulk in material of both sexes from the localities within the coastal drainage section of the Cameroons than is the case with that from Bitje, which is on the Ja River to the eastward in the Sanga (Oubangi-Congo) watershed.

In coloration there is some range from gray browns to wood browns, or even to mummy brown, the only really striking departure being the presence of pale brick red areas on the top of the head, on the cephalic and caudal bullations of the pronotal dorsum and on the caudal femora in one Bitje female, and also on the pleura of one Lolodorf and one Bitje female. In several other individuals there are less evident traces of brick red in the same areas. The males average more grayish, the females more brownish, but there are exceptions in the material of both sexes. In the female the antennae range from the annulate type originally described to almost solidly mummy brown, while in the male they are generally pale with a proximal infuscation. The Ebolowa male curiously has one antenna pale, the other almost entirely heavily infuscate, yet the individual otherwise shows no evidence of desiccation color change.

Parapetasia (Parapetasia) calabarica[36] new species

(Plate II, fig. 17; plate III, fig. 26.)

Differing from *P. femorata* I. Bolívar chiefly in the characters given in the preceding key, and also in the female sex in its more slender form, less expanded caudo-ventral section of the lateral lobes of the pronotum, the narrower inflated caudal portion of the

[36] From the historic name of that portion of southern Nigeria from which this species is known.

dorsum of the pronotum, as well as the more rounded character of the pronotal tubercles and the proportionately longer caudal femora. The male sex is as yet unknown.

Type.— ♀ ; Oban District,[37] Southern Nigeria. (P. A. Talbot.) [Academy of Natural Sciences of Philadelphia, Type no. 5775.]

Size large; form elongate, appreciably more slender than in *P. femorata*; surface rugosities as a whole blunter, less acuminate and also less lamellate than in *femorata.*

Head essentially as in *femorata* except that the eyes are somewhat less prominent laterad as seen from the dorsum, and the facial outline in profile is less strongly concave.

Pronotum distinctly less expanded caudad than in *femorata*, more compressed, the greatest breadth across the caudal processes of the lateral lobes being equal to but four-fifths of the greatest length of the pronotal dorsum (as 79 to 97), the extremities of these caudal processes also blunter and obtusely truncate, instead of virtually rectangulate as in the same sex of *femorata*; sellation of the dorsum of the pronotum essentially as in *femorata* except that the cephalic bullation is slightly narrower and in outline more sharply declivent caudad, while the metazonal one is distinctly narrower and with its surface less tuberculate. Metanotum with glabrous contrastingly colored medio-dorsal section essentially as in *femorata.*

Abdomen as in *femorata* except that the medio-dorsal series of bullations (one to a tergite) are less trigonal in outline as seen from the dorsum and more rounded, bearing, as in *femorata*, the distinct median carinula. Sternal characters as in *femorata*

Cephalic and median limbs as in *femorata*; caudal femora more elongate than in *femorata*, their proximal deplanate areas as in the latter.

Measurements: length of body, 61.3 mm.; length of antenna, 16.3; length of pronotum, 15.4; greatest breadth of pronotum across lateral lobes, 12.8; exposed costal length of tegmen, 2.77; length of caudal femur, 25.2; length of caudal tibia, 23.6.

Coloration.[38]—Head and thorax clay color to tawny-olive, passing to verona brown on the abdomen and bister on most of the venter. Pronotum with the inflated portions of the metazonal dorsum cinnamon-rufous, most of the metazonal section of the lateral lobes infuscate with prout's brown; greater part of the glabrous area on the dorsum of the metanotum, lateral surfaces of the second abdominal tergite, the dorso-proximal deplanation of the caudal femoral bases, linear pencilling on the extensor surface of the

[37] The settlement of Oban is in the Calabar district, about thirty miles NNE. of Calabar, near one of the tributaries of the Cross River.

[38] There may have been some postmortem discoloration of this specimen as it had not been eviscerated, but presumably any alterations have been of minor importance, and the coloration here given is the present condition of the type.

caudal tibiae, the distal extremities of all tibiae, the distal article of all tarsi, as well as the distal extremity of the cephalic femora and numerous maculations on the paler areas of both the cephalic and median femora, fuscous-black. Eyes of base color. Antennae fuscous-black in proximal three-fifths and at the immediate apex, area between clay color micro-punctulate with fuscous-black.

The type of this striking species is unique.

Loveridgea[39] new subgenus

Genotype (here designated): *Petasia impotens* Karsch [= *Parapetasia* (*Loveridgea*) *impotens* (Karsch)].

The chief characters of this new subgenus have been given in the preceding key to the subgenera of *Parapetasia,* and these will readily distinguish it from *Parapetasia* s. s. In addition the outline of the fastigium, as seen from the dorsum, is semi-ovate and not definitely trigonal as in true *Parapetasia,* and the prosternal process is more decidedly trigonal in its transverse profile compared with the subarcuate (male) to low obtuse-angulate (female) outline seen in the other subgenus. The obliquely deplanate area at the base of the caudal femora is also less pronounced in *Loveridgea* than in typical *Parapetasia.*

The two species of the subgenus now before me may be separated by the following principal differences:

Size large; form in both sexes more robust. Pronotum with more numerous, more elevated and more strongly marked tuberculations. Limbs longer, particularly the caudal femora. Antennae largely pale. (Usambara Mountains, Tanganyika.) .....**impotens** (Karsch)

Size smaller; form in both sexes less robust. Pronotum with somewhat fewer, less elevated and less strongly marked tuberculations. Limbs shorter, particularly the caudal femora. Antennae almost entirely blackish fuscous. (Uluguru Mountains, Tanganyika.)

ulugurensis new species

The distribution of the three species which I would refer to the subgenus *Loveridgea* is a matter of particular interest, and supplies further evidence of the underlying affinity of the fauna of the

[39] In recognition of the valuable contributions, both field and laboratory, which have been made to our knowledge of the zoology of Africa by Mr. Arthur Loveridge, Curator of Reptiles of the Museum of Comparative Zoology, who also collected some of the material of this subgenus here recorded.

Cameroons highlands with that of elevated areas of East and east-central Africa, as contrasted with that of the lowland West African forest areas of the less elevated Cameroons and adjacent southern Nigeria. In these latter districts we find typical *Parapetasia,* but *P. rammei* Sjöstedt,[40] of the Cameroons more elevated section is a very near relative of the genotype of *Loveridgea,* i.e. *P.* (*L.*) *impotens* of north-eastern Tanganyika. This is parallel to what I have already pointed out in regard to certain members of the genus *Parasphena,*[41] in which a Cameroons montane species (*P. uvarovi*) has as its nearest relative one from elevated Ruanda, the Lake Kivu vicinity and the Virunga Volcanoes in the eastern part of the Belgian Congo.

Parapetasia (Loveridgea) impotens (Karsch)
(Plate II, figs. 21 and 22; plate III, figs. 22 and 25.)

1888. *Petasia impotens* Karsch, Entom. Nachrichten, XIV, p. 360. [♂; Usegna [error for Usegua],[42] German East Africa [= present Tanganyika Territory].]

TANGANYIKA: Amani, Usambara Mountains; XI, 26, 1926; (A. Loveridge); 1 ♂, 2 ♀; [M.C.Z. and A.N.S.P.]: XI, 26, 1904; (Vosseler); 1 ♂; [A.N.S.P.]: 6 ♂, 1 ♀, 1 juv. ♂; [A.N.S.P.]. Mt. Lutindi;[43] Usambara Mountains; XII, 11, 1926; (A. Loveridge); 1 ♀; [M.C.Z.]. Kizerui,[44] Usambara Mountains, 1926; (A. Loveridge); 1 ♀; [M.C.Z.].

The male collected by Vosseler was received in exchange from the Berlin Zoological Museum and was determined and labelled as *impotens* by Ramme. As the type of this species is contained in the Berlin series this specimen can be regarded as having had type comparison value.

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[40] *Parapetasia rammei* Sjöstedt, Arkiv för Zoologi, 15, no. 22, p. 10, pl. 1, figs. 1 and 2 (1923). [♂, ♀; Bare-Dschang, Cameroons (type locality); Bamenda, Cameroons; Bangwe, 1000 meters, North Cameroons.]

[41] Proc. Acad. Nat. Sci. Phila., XCIV, pp. 288, 300, 301 (1942).

[42] Usegua is now spelled Uzigua, according to Mr. Loveridge, who advises me it is a tribal area in the Korogwe and Pangani Districts at the foot of the Usambara mountains, but that the tribe occupies much of the country lying between the lower Pangani, the Nguru mountains, the Uluguru mountains, and the sea, i.e. from 3000 feet to sea-level.

[43] Mr. Loveridge advises me Mt. Lutindi is in the Usambara range. Notes on the locality have been published by him in a report on the herpetology of the region, see Barbour and Loveridge, Mem. Mus. Comp. Zool., 50, no. 2, pp. 102-103 (1928).

[44] Barbour and Loveridge (see footnote 43) state this locality is in a region of magnificent forest, at 4000 feet elevation.

In both sexes there is some plasticity in the exact strength and outline of the pronotal excrescences, both tuberculate and carinate, but usually this is manifest in the degree to which individual nodules on the cariniform structures coalesce or retain their individual identity. The Amani series shows this to a very appreciable degree, and in both sexes.

There is a considerable range in size, particularly in the male sex. The measurements (in millimeters) of the extremes from Amani and of the Mt. Lutindi individual are as follows:

	Length of body	Length of pronotum	Greatest breadth of pronotum across lateral lobes caudad	Length of tegmen	Length of caudal femur
♂, Amani	48.3	12.5	12.0	11.6	22.5
♂, Amani	54.0	15.0	13.0	15.0	25.5
♀, Amani	59.5	15.3	13.5	15.5	26.2
♀, Amani	59.0	17.0	15.5	17.0	26.5
♀, Mt. Lutindi	54.8[45]	17.0	15.0	14.5	26.8

Parapetasia (Loveridgea) ulugurensis new species
(Plate II, figs. 18 and 19, plate III, figs. 23 and 24.)

The chief characteristics separating this species from *impotens* have been given in the preceding key.

Type.— ♂; Vituri,[46] Uluguru Mountains, Tanganyika Territory. October, 1926. (A. Loveridge.) [Museum of Comparative Zoology.]

Size somewhat smaller than in the same sex of *P.* (*L.*) *impotens*; form as a whole less robust, somewhat less expanded laterad; surface with tuberculations, strumae and carinations less strongly marked or less elevated than in *impotens*.

Head with greatest breadth across eyes equal to 1.25 times the exposed medio-dorsal length of the head; fastigium in outline, as seen from the dorsum, semi-elliptical, greatest length cephalad of the eyes equal to four-fifths the fastigial breadth at the cephalic point of the eyes, median fissure reaching caudad for three-fourths of the fastigial length, occiput in profile ascending caudad from the fastigial base, greatest interocular breadth equal to four-fifths of the basal fastigial width (as 21 to 26); fastigial production

[45] Abdomen less extended than in the other females measured.

[46] According to Mr. Loveridge, Vituri is at 2000 feet elevation in the Uluguru range. See Barbour and Loveridge, Mem. Mus. Comp. Zool., 50, no. 2, pp. 98-99, 103 (1928).

as seen in profile, facial profile and facial concavity as in *impotens*; eyes as seen from dorsum slightly more prominent than in *impotens*, basal outline more ovoid and less elliptical than in *impotens*, the greatest breadth of the outline being equal to three-fourths of the greatest depth of the same; antennae equal to slightly more than 1.25 times the medio-dorsal length of the pronotum (as 105 to 80).

Pronotum in general characteristics as in *impotens* but with most of the asperities less strongly developed, carinations less emphasized, and the mid-surface bullation of the metazonal section of the disk less evident, although that cephalad on the prozona is as in *impotens*; greatest breadth of pronotum across the ventro-caudal angles of the lateral lobes equal to seven-eighths of the median pronotal length.

Tegmina ovate, with their visible length from the apparent point of articulation subequal to the median pronotal length, reaching distad to the base of the fourth abdominal tergite, their greatest breadth equal to three-fifths of their length (as 48 to 80), costal margin more evenly arcuate throughout and not as flattened mesad as in *impotens*, reticulation of the tegmina as in the latter.

Abdomen as in *impotens* except that the subgenital plate, as viewed in profile, has its angulate outline slightly blunter.

Sternal features as in the male of *impotens*.

Cephalic and median limbs slightly shorter than in *impotens*. Caudal femora but faintly more than 1.5 times the length of the pronotum, while in *impotens* this ratio is 1.7 to 1.8, in form proportionately more robust and not as slender as in *impotens*; caudal tibiae also proportionately shorter and somewhat more robust.

Allotype.— ♀; same data as type. [Museum of Comparative Zoology.]

Differing from the above description of the male sex, and also from the female of *impotens*, in the following noteworthy respects.

Size somewhat smaller than the same sex of *P.* (*L.*) *impotens*; form as in the male, less robust and less expanded laterad than *impotens*; surface features much as in the male sex.

Head with greatest breadth across the eyes but 1.1 times the exposed medio-dorsal length of the head; fastigium in general form as in male but faintly more acute cephalad, proportions of fastigium, median fissure, interocular space and occipital outline as in male; eyes, as in the male, when seen from the dorsum slightly more prominent than in the female of *impotens*, basal outline as in latter; antennal proportions as in male.

Pronotum with its general build very appreciably less expanded laterad than in the female of *impotens*, its greatest breadth across the lateral lobes caudad equal to approximately seventeen-twentieths of the greatest median length of the pronotal disk (as 82 to 97), the greatest width of the metazonal disk itself equal to about two-thirds of the pronotal length (as 64 to

97), caudal margin of the disk less broadly arcuate than in *impotens*, ventrocaudal angles of the lateral lobes less pronounced than in the sex of *impotens*, most of the surface tuberculations less elevated and less emphasized, and the lateral carinae of the disk less strongly lamellate and on the metazona less undercut, while on the dorsal surface of the metazona there is less evidence of and less apparent radiation caudad of the lower surface strumae.

Tegmina essentially as in the female of *impotens* in development, shape and reticulation, in length reaching to the middle of the third abdominal tergite.

Abdomen and its appendages as in the same sex of *impotens*.

Limb proportions in comparison with the female of *impotens* as given from the male sex of this species.

Measurements (in millimeters)

	Length of body	Length of pronotum	Greatest breadth of pronotum across lateral lobes caudad	Length of tegmen	Length of caudal femur
♂, Vituri, Uluguru Mts., Tang., *type* ..	43.6	13.0	11.4	13.0	20.7
♀, Vituri, Uluguru Mts., Tang., *allotype*	53.0	15.4	13.0	13.0	23.7
♀, Uluguru Mts., Tang., *paratype* ...	54.5	16.0	14.3	17.5	23.0

Coloration.—All available material of *ulugurensis* has been dried after wet preservation, and in consequence the present color tones have little value in a comparative sense, although the pattern is probably near that of life. The present general tone ranges from orange-cinnamon on the head, pronotum and limbs to ochraceous-buff on the abdomen (in the least discolored specimen), the tegmina cinnamon-buff to orange-cinnamon with the venational network nearer vinaceous-rufous. In the allotype the coloration is almost entirely vinaceous-tawny. The eyes are tawny-olive to snuff brown, sometimes mottled with fuscous, the antennae are almost or quite solidly blackish fuscous, in the female allotype alone faintly tinged with dull reddish on a few proximal articles. The cephalic and median limbs have the femora with or without blackish ventrad, this sometimes involving the venter of the respective tibiae and also the tarsi. Caudal femora with the ventral sulcus, the ventro-external face and much of the internal one ventrad blackish, the caudal tibiae, except briefly proximo-dorsad and proximo-laterad, and the tarsi blackish.

Remarks.—In addition to the type and allotype I have examined two females from the Uluguru Mountains without exact locality, which were taken in 1926 by A. Loveridge, which I regard as paratypes. These are now in the collections of the Museum of Comparative Zoology and of the Academy of Natural Sciences of Philadelphia.

Poekilocerus hieroglyphicus (Klug)

1832. *Decticus hieroglyphicus* Klug, Symbol. Phys., decas III, pl. XXV, figs. 1 and 2. [♀; Ambukol, Dongola [, Sudan].]

SUDAN: Khartoum; VI, 8, 1942; (J. W. H. Rehn); 1 ♀: IV, 29, 1914; (R. Cottam); 1 ♀. Port Sudan; VII, 13, 1920; (A. Loveridge); 1 ♀; [M.C.Z.].
ERITREA: Arafali; 1 ♂.

These specimens have been compared with a female from Senegal, determined by Saussure and from his collection, received in exchange by the Academy from the Geneva Museum. The antennae in all of the Sudan and the Eritrea individuals are fuscous black in at least their distal halves, with a variable number of yellow or orange annulations.

Pyrgomorphella madecassa I. Bolívar

1904. *P[yrgomorphella] madecassa* I. Bolívar, Boletín R. Soc. Españ. Hist. Nat., IV, pp. 457, 458. [♂, ♀; Madagascar.]

MADAGASCAR: no exact locality; (Lamberton); 1 ♀.

This specimen agrees in every detail, including size, with the original description, except that the exceedingly abbreviate, but fully formed, tegmina are acuminate, and not rounded as originally described. It would seem that the exact shape of the apices of these minute appendages is subject to variation.

Pyrgomorphella capensis Key

1937. *Pyrgomorphella capensis* Key, Ann. So. Afr. Mus., XXXII, pp. 150, 151, pl. XVII, figs. E and F. [♂ (type), ♀; Cape Flats, Cape Peninsula, South Africa.]

SOUTH AFRICA: Cape Flats, False Bay; III, 1, 4 and 11, 1939; (E. R. Helwig); 4 ♀.

These topotypic specimens agree quite well with Key's original description, which, however, was based largely on the male, which sex is not before me. Key has noted that the coloration in both sexes is very variable, but he gives details only for the type and allotype, and in consequence the following notes should be of value. The present females are dichromatic, but one being purplish brown, two with the body entirely green (viridine green of Ridgway), and one with it brownish green. The antennae are purplish brown in all which still possess them (three of the four). The dark brown

lateral abdominal stripe, originally described, is indicated only in the purplish brown individual, and there but weakly. The cephalic and median limbs and the caudal femora are concolorous with the body in all, the caudal tibiae markedly glaucous green in the two green females, weaker glaucous in the brownish green specimen, and unicolorous with the femora in the purplish brown one.

Pyrgomorphella rubripennulis Key (Plate IV, figs. 31-34.)

1937. *Pyrgomorphella rubripennulis* Key, Ann. So. Afr. Mus., XXXII, pp. 151, 157, pl. XVII, figs. C and H. [♂ (type), ♀; Grahamstown, Eastern Cape Province, South Africa.]

South Africa: Port Elizabeth, Cape Province; V, 15, 1939; (E. R. Helwig); 6 ♂, 4 ♀.

These specimens show most of the lines of variation in certain structural features originally noted, such as the number of spines on the caudal tibiae, and also in the coloration. However, the caudal margin of the dorsum of the pronotum in all the males is more sinuate laterad of the apex than is shown in Key's figure C, and also in four of that sex the apex is shallowly emarginate mesad (a condition stated in the original description to be found in one male paratype). The same figure has the fastigium proportionately too broad to agree with the wording in the description, i.e. " as long as broad ", and with the males now before me.

In size the present males average slightly smaller, the females slightly larger, than the dimensions originally given, but these differences are not of sufficient importance to be noted in detail. As a whole the males show less of the originally mentioned purplish brown tone than the Grahamstown series, this less invading the green tone than as originally described for that sex. In two males the pronotal disk shows almost no overwash of purplish brown, except along the metazonal lateral carinae, while in but two of that sex is the basic green of the tegmina overwashed with purplish brown on the internal half of those appendages.

Pyrgomorphella angolensis new species (Plate IV, figs. 35-38.)

More nearly related to *P. rubripennulis* Key, with material of which it has been compared, than to any other known species. It can readily be distinguished by numerous points of difference, the more readily evident of which are, the more conical head, the longer

and narrower fastigium in both sexes as seen from the dorsum, the longer antennae, the shorter and broader basal eye outline, the subtruncate and mesad emarginate caudal margin of the pronotal dorsum, the less obvious and less subcarinate lateral shoulders of the pronotum caudad, the longer tegmina in both sexes, these being more elongate lanceolate-ovate in outline, in the more elongate male cerci, and in the less rostrate subgenital plate of the same sex, while the ovipositor valves of the female are somewhat more robust.

The only other species of the genus which appears to be at all closely related to *angolensis* is Brunner's *serbica,* which, however, has a short, less attenuate form, much more sharply indicated pronotal carinae, a subtruncate caudal margin of the pronotal dorsum, and peculiarities of the frontal costa.

Type.— ♂ ; Palavange, Angola.[47] November 2, 1930. (Second Prentiss Gray African Expedition; H. T. Green.) [Academy of Natural Sciences of Philadelphia, Type no. 5776.]

Size above average for the genus; form slenderly fusiform, essentially as in *P. rubripennulis* in proportions; surface with the very numerous impresso-punctulations much as in *rubripennulis.*

Head markedly conical, much more attenuate than in *rubripennulis*; fastigium much produced, in length as seen from the dorsum but slightly less than the length of the eye in the same aspect, greatest breadth of fastigium proximad (i.e. between ocelli) nearly equal to fastigial length distad of eyes (as 24 to 25), lateral margins of fastigium moderately converging distad and appreciably sinuate, apex rather broadly subobtuse rotundate, median fissure extending caudad approximately half the fastigial length; interocular space approximately two-thirds as broad as the proximal width of the fastigium (as 17 to 24), a low but well-marked medio-longitudinal carinula extends caudad from the end of the median fissure over the occiput, outline of occiput as seen in profile nearly straight to the cephalic border of the eyes; fastigio-facial angle subacutely rounded, not as sharp as in *rubripennulis,* facial line nearly straight oblique retreating, not distinctly concave as in *rubripennulis*; frontal costa very narrow, just failing to reach the supraclypeal suture, linearly sulcate throughout, its carinate borders subparallel except for a weak divergence ventrad, contiguous at the fastigio-facial juncture, accessory facial carinae well marked, reaching from the insertion of the antennae to the base of the mandibles, subparallel dorsad and ventrad, appreciably but evenly diverging in their median section, oblique genal series of tubercles irregularly grouped in three series of pronounced, rounded and pustulose structures. Eyes but moderately prominent as seen from the dorsum, basal outline ovate, weakly angulate ventro-caudad, greatest breadth

[47] For the position of this locality see footnote 28 under *Camoensia insignis.*

of basal outline equal to eleven-fourteenths of the greatest length of the same. Antennae with their length surpassing that of the head and pronotum combined by a distance equal to the length of the eye, much more slender than in *rubripennulis*, slightly depressed, composed of 21 articles,[48] all more elongate than those of the compared species.

Pronotum in general form evenly expanding caudad, its greatest dorsal length slightly greater than that of the exposed dorsum of the head (as 29 to 27), greatest breadth caudad across lateral lobes equal to eight-ninths of the dorsal length (as 24 to 27); cephalic and caudal margins of disk subtruncate with a very shallow and relatively broad median emargination; but second and third (principal) transverse sulci evident on both the dorsum and lateral lobes, both intersecting the median carina and the lateral shoulders, the third nearly straight, the second obtuse-angulately advanced mesad; median carina distinct and precurrent but substrumosely indirect, lateral shoulders with appreciable but low carinations cephalad of the second transverse sulcus, these slightly converging caudad to that point, thence caudad no definite lateral carinae are present and the metazonal shoulders are very low and well rounded; lateral lobes with their length dorsad at the lateral shoulders twice their greatest depth (at principal sulcus), second transverse sulcus reaching ventrad to the ventral border, third (principal one) not reaching to the ventral half of the lobes, cephalic margin nearly straight, strongly oblique, ventro-cephalic angle broadly rounded obtuse, ventral margin obliquely subconcave cephalad, straight and longitudinal caudad, ventro-caudal angle rectangulate, caudal margin concavely emarginate with its ventral two-fifths straight vertical, thence dorsad oblique to its juncture with the caudal margin of the disk, tubercles on surface of ventral section of lobes similar to but more spaced than those of the genae, also several are marginal on the straight portion of the caudal margin of the lobes.

Tegmina reaching to the base of the second abdominal tergite, ovate in outline, the greatest breadth equal to half their exposed length (as 11 to 21); costal margin strongly arcuate in distal third to the weakly angulate apex, sutural margin with distal half arcuate to the apex of the tegmina; longitudinal venation evident but anastomosed with the short transverse nervures in a marked and well-impressed areolation. Wings present but aborted, not more than half as long as the tegmina.

Abdomen moderately tectate dorsad, but not definitely carinate; ultimate tergite with its distal margin concavely emarginate mesad and this subsinuate laterad with slightly thickened and very shallow sublobations dorsad of the lateral sections of the base of the supra-anal plate, which latter is acutely pyramidical in outline, its breadth at base equal to approximately four-fifths of the median length (as 19 to 24), the dorsal surface arcuate transversely and without a continuous medio-longitudinal sulcation; cerci as seen in profile tapering subsigmoid, with the distal third weakly decurving, reaching almost

[48] In *rubripennulis* the male has 16-17 articles, this difference found, by extraneous subdivision, in the antennae of a single male.

as far distad as the apex of the supra-anal plate;[49] subgenital plate much broader and more bulbous than in *rubripennulis*. Prosternum transverse, low, rounded transversely, without a median tubercle. Mesosternal interspace subquadrate, slightly longer than proximal breadth (as 22 to 19), very slightly narrowing distad, the mesosternal lobes with their greatest width subequal to their length at internal border (as 21 to 22), meso-caudal angle and internal third of caudal margin strongly arcuate, produced caudad of the straight external third of the caudal margin of the lobes; metasternal lobes separated caudad of the foveolae by a distance hardly more than one-fourth that between the metasternal foveolae, caudal margin of the metasternal lobes obliquely arcuate divergent.

Caudal and median femora slightly stockier and more robust than those of the male of *rubripennulis*. Caudal femora surpassing the apex of the abdomen by a distance but little less than the dorsal length of the pronotum, in general form much as in the same sex of *rubripennulis* but slightly more slender, the greatest depth being contained 4.9 times in their length (as opposed to 5.2 times in the male of *rubripennulis*), sculpture and carinal emphasis as in *rubripennulis*, but with whitish strumose tubercles on the ventral section of the paginal chevron pattern larger and more strongly indicated; caudal tibiae slightly shorter than the femora, armed on the external margin with 7-8, on the internal with 10 spines, no apical one on external side.

Allotype.— ♀; same data as type. [Academy of Natural Sciences of Philadelphia.]

Size, as in the male, above average for the genus; form more markedly fusiform than in male sex; surface sculpture in general as complex and intricate as in the female of *rubripennulis*, but with the texture of the body sculpture less asperous.

Head, as in the male, markedly conical; fastigium in general outline as in the male, as seen from the dorsum subequal in length to the eye in the same aspect, proportions and lateral margins as in male, apex slightly broader and somewhat more obtusely rounded, median fissure not quite reaching as far caudad as the middle of the fastigium; interocular space equal to four-fifths of the greatest proximal width of the fastigium (as 24 to 30), occipital carina as in male, outline of occiput as seen in profile straight and horizontal caudad of the interocular space; fastigio-facial angle subacute, but faintly less so than in the female of *rubripennulis*, much sharper than in the male of the present species, facial line strongly oblique retreating, very faintly concave, this far less evident than in the female of *rubripennulis*; frontal costa and accessory facial carinae as in the male sex, genal tubercles as in the male but individual ones proportionately smaller and less strongly emphasized. Eyes as seen from dorsum slightly more prominent than in the female of *rubripennulis*, basal outline much as in male, more rounded and less subacuminate dorso-cephalad than in female of *rubripennulis*, greatest breadth

[49] The cercus of *rubripennulis* is in general similar in shape, but is definitely shorter and in no way subequal in length to the supra-anal plate.

of eye basal outline slightly less than two-thirds the length of the same (as 22 to 31). Antennae in length slightly less than that of head and pronotum combined (as 64 to 70), as in the male sex much more slender than in *rubripennulis*, with 20 apparent articles (16 in the female of *rubripennulis*), proportions of the latter as in the male sex.

Pronotum more regularly and more markedly broadening caudad than in the female of *rubripennulis* or in the male of the present species, the greatest breadth caudad across the lateral lobes subequal to the greatest length of the pronotum; cephalic and caudal margins of the disk as in the male, median carina somewhat less evident than in the male, lateral carinae of the cephalic portion of disk subobsolete, the weak intimations somewhat diverging caudad toward second transverse sulcus, instead of converging as in the male; metazonal disk broad, twice as wide as long, its lateral shoulders evident but well rounded and not at all carinate; lateral lobes slightly deeper proportionately than in the male, their length dorsad at the lateral shoulders not quite twice their greatest depth, margins of the lobes as in male except that the straight, more caudal section of the ventral margin is less horizontal and slightly oblique declivent to the somewhat sharper ventro-caudal angle, caudal margin as a whole more broadly concave than in the male.

Tegmina reaching to the distal portion of the second abdominal tergite, acute elliptical in outline, their greatest breadth subequal to five-twelfths of their length (as 15 to 36); margins as in male but apex narrowly rounded acute; principal longitudinal venation more sharply marked than in male, short transverse nervures more regularly and evenly spaced than in male, especially in the discoidal field. Wings as in male.

Abdomen more decidedly tectate dorsad than in male, moderately but not strongly carinate; ultimate tergite essentially as in the female of *rubripennulis*; supra-anal plate more sharply acute-trigonal in outline than in the female of *rubripennulis*, the proximal breadth of the plate equal to but three-fourths of its greatest length (as 25 to 33), as against four-fifths in the female of *rubripennulis* (as 19 to 24); cerci conical, short, their apices not quite reaching half-way to the apex of the supra-anal plate; ovipositor valves thicker, much less compressed and stouter than in the female of *rubripennulis*, the concavity of the dorsal surface of the dorsal valves sharply limited to the distal half (extending close to base in *rubripennulis*), dorsal surface markedly strumose, dorso-external margin distinctly serrate except on recurved portion, ventral valves with recurved portion alone more slender than in *rubripennulis*, tooth on ventro-external margin strongly developed and adjacent, more internal ventral surface more broadly and completely concavo-excavate, lateral plates longer and more acutely lanceolate than in *rubripennulis*; subgenital plate with distal margin as a whole broadly and rather shallowly concave except for the acutely trigonal inter-valvular process, dorso-lateral angles of the margin narrowly rounded subrectangulate.

Prosternum as in male. Mesosternal interspace transverse, its cephalic breadth equal to one and two-thirds times the depth of the interspace (as 50

to 30), the latter regularly narrowing caudad to the well-rounded mesocaudal angles of the mesosternal lobes, the proportions of the latter as in the male; metasternal interspace between the foveolae strongly transverse and very narrow, its breadth subequal to the greatest (cephalic) width of the mesosternal interspace.

Cephalic and median femora in build and proportions essentially as in the female of *rubripennulis*. Caudal femora faintly surpassing the apices of the ovipositor valves, in general form as in female of *rubripennulis* but very slightly more slender, their greatest depth contained approximately 5.3 times in their length (as 15.5 to 82), paginal pattern more strongly indicated ventrad than in *rubripennulis*; caudal tibiae very slightly shorter than the femora, external spines 8 to 9, internal 10, with no external apical one.

Measurements (in millimeters)

	Length of body	Length of antenna	Length of protum	Greatest width of pronotum caudad across lateral lobes	Length of tegmen	Length of caudal femur
♂, Palavange, Angola, *type* ...	19.0	9.6	4.4	3.9	3.4	11.5
♂, Palavange, Angola, *paratype*	22.0	...[50]	4.8	4.0	4.0	12.0
♀, Palavange, Angola, *allotype*	26.3	10.2	6.6	6.5	5.8	13.3

Coloration.—All of the available material of the present species except the type and allotype have had their coloration destroyed, or so seriously altered by post-mortem desiccation, that only those two specimens can be utilized in the description of coloration. The general tone of these two is mignonette green, passing to olive-ocher on the abdomen in the male type, and to lime green on the tegmina of the same. The genal and both lateral and infrequent dorsal pronotal tubercles, as well as the nodules on the median femora, and those on the paginal pattern of the caudal femora, and single ocelliform lateral spots on each of the abdominal segments, are creamy white; antennae lead gray; eyes mottled ochraceous-tawny and bister; ventral surface of male rather buffy; distal half of caudal tibiae and all of caudal tarsi grenadine pink, on the former passing evenly to the general coloration proximad, the grenadine tone weaker in the female than in the male; male cerci narrowly washed distad with grenadine pink.

Paratypes.—In addition to the type and allotype I have before me one male and three females bearing the same data as the type, and which I am regarding as paratypes.

[50] Incomplete.

Tagasta indica I. Bolívar

This southeastern Asian species breaks up into two well-marked subspecies, and one name which had been proposed as a variety of *indica* is seen, on the evidence of a topotype of it and a series of *i. indica,* to be indistinguishable from the latter. The features originally given by I. Bolívar to distinguish "variety *tonkinensis*" are valueless, as they are merely individual, and are fully covered by variants in the fair series of *i. indica* from a single locality now before me. There is no constancy in the relative length of the tegmina and wings—one of the supposed differential features of *tonkinensis*—as evidenced by the present series, and a topotype of that form, now before me, does not agree with the original description in this respect. Similarly the present series of *i. indica* shows that the color tone of the antennae varies very considerably in the Ledo Road representation, and the same is true of that of the caudal tibiae, especially in the male sex.

The two geographic subspecies of *indica* now before me can be distinguished as follows:

Fastigium in both sexes with its length cephalad of the eyes greater than its breadth at base (i.e. at the ocelli). Cephalic and median femora proportionately somewhat longer and thinner, especially in the male. (Bhutan, Assam, Burma, southern Thailand and Tonkin.) ....**i. indica** I. Bolívar

Fastigium in both sexes with its length cephalad of the eyes subequal to its breadth at base (i.e. at the ocelli). Cephalic and median femora proportionately somewhat shorter and stouter, especially in the male. (Northern Thailand.) .....**i. mutata** new subspecies

Tagasta indica indica I. Bolívar (Plate IV, figs. 39 and 40.)

1905. *T*[*agasta*] *indica* I. Bolívar, Boletín R. Soc. Españ. Hist. Nat., V, pp. 112, 113. [♂, ♀; Maria Basti [, Bhutan].]

1905. [*Tagasta indica*] var. *tonkinensis* I. Bolívar, Boletín R. Soc. Españ. Hist. Nat., V, pp. 113, 114. [♂, ♀; Chiem Hoa, central Tonkin.]

ASSAM: Ledo Road, 1.3 miles from Ledo; VII, 16, 1944; (J. W. H. Rehn); 2 ♂, 1 juv. ♀: VII, 30, 1944; (J. W. H. Rehn); 11 ♂, 2 juv. ♀: VIII, 19, 1944; (J. W. H. Rehn); 5 ♂, 4 ♀: X, 14, 1944; (J. W. H. Rehn); 1 ♂, 1 ♀.

BURMA: Toungoo; (A. V. B. Crumb); 1 ♂.

THAILAND: Bangkok; V, 9, 1920; 3 ♂, 1 ♀, 1 juv. ♀.

TONKIN: Chiem Hoa; VIII-IX; (ex Fruhstorfer); 1 ♀.

The series of thirty adults establishes beyond doubt the synonymy of *tonkinensis,* as the broad range of variability shown by the Ledo series alone leaves no other course.

In size there is a very marked range, as the following measurements (in millimeters) show:

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
♂, Ledo Road, Assam	23.5	5.7	17.9	14.1
♂, Ledo Road, Assam	26.5	6.1	17.7	15.3
♂, Toungoo, Burma	23.0	6.0	18.2	15.4
♂, Bangkok, Thailand	22.0	5.5	15.9	13.2
♂, Bangkok, Thailand	26.0	6.1	17.1	14.1
♀, Ledo Road, Assam	29.0	7.1	20.2	15.8
♀, Ledo Road, Assam	34.0	8.3	22.0	17.9
♀, Bangkok, Thailand	30.0	8.1	20.0	16.7
♀, Chiem Hoa, Tonkin	36.0	8.8	24.1	18.4

Bolivar's original measurements of the type material of *i. indica* are all somewhat smaller than the minima given above for both sexes, but this may be due to his Maria Basti, Bhutan, material having been taken nearer the peripheral margin of the subspecies (and species) distribution, and perhaps at a higher elevation than the Ledo Road series here recorded. The Chiem Hoa female here measured is somewhat larger than his measurements of the female of his "var. *tonkinensis*" from the same locality.

As already stated the relative length of the tegmina and wings shows considerable variation, and such a regular gradation, even in material from the same locality, that no value can be attached to this supposed differential feature. The caudal tibiae range in tone, in the Ledo Road series, from pale glaucous green to a deep glaucous blue, this range most evident in the male sex. The female topotype of *tonkinensis* from Chiem Hoa has the caudal tibiae marked glaucous green and not "coeruleae" as described for that form. The antennae range in tone from pale olive lake (of Ridgway) to deep olive, and this in the Ledo Road series alone.

One feature of variation, not previously mentioned, is that both sexes from Bangkok, Thailand, have the tegmina and wings averaging sharper at their apices than in individuals from elsewhere. While there is some variation in this respect in the Ledo Road material, and of both sexes, none of these are as acuminate in their

apical outline as those from Bangkok. In this respect the Chiem Hoa female and the Toungoo, Burma, male are inseparable from Ledo Road individuals of the same sexes. It is probable this tendency is a purely local condition, such as is frequently found in the Acrididae, but additional south Thailand material might show it to be more broadly developed.

All of the Ledo Road material was taken in the same limited area. Dr. John Rehn's field notes relative to this locality and species are as follows: "High area overlooking road with trail through natural cover, trees of various types, banana patches, bamboo thickets, spiny shrubs, etc., with ground layer of fern, vines, litter of dead leaves, branches, leaf mold, etc., and at edge of woodland patches of grass and shrubs with some bare areas." On July 16 there were "few adults, with juvs. numerous over all types of low vegetation;" on July 30 it was said to be "common, general, except in thickest cover, majority last stage juvs., clumsy but rather active, with flash coloration;" on August 19, "numerous, general, practically all adults, definitely not a 'weed species' as it is generally distributed."

Tagasta indica mutata [51] new subspecies (Plate V, figs. 41-44.)

The more salient features which distinguish this subspecies from *T. i. indica* have been given in the preceding key to the subspecies of *indica.*

Type.— ♂; Chieng Mai, north Thailand. January 15 to March 1, 1933. (DeSchauensee-Sinkler Expedition.) [Academy of Natural Sciences of Philadelphia, Type no. 5777.]

When compared with a typical male of *i. indica* from the Ledo Road, Assam, the present individual shows the following noteworthy differences.

General form somewhat more robust, not quite as slender. Head less attenuately conical as seen in both dorsal and lateral aspects; fastigium shorter and more broadly conical, the greatest breadth at the ocelli subequal to the fastigial length distad of the eyes, instead of but nine-elevenths of the same as in representative males of *T. i. indica,* in profile the fastigium is slightly shorter than the eye length, instead of subequal, apex of fastigium as seen in both dorsal and lateral aspects somewhat more bluntly rounded. Pronotum slightly less compressed, the greatest breadth caudad across the

[51] I.e. *different.*

lateral lobes slightly greater proportionately than in *i. indica*, the ratio of greatest breadth caudad across the lateral lobes to greatest pronotal length being as 31 to 41, as opposed to 30.5 to 39 in *i. indica*; medio-longitudinal carina of pronotal dorsum virtually obsolete. Tegmina and wings not surpassing the apex of the abdomen, while in *i. indica* the reverse is almost always the case. Cerci with their apices somewhat more attenuate, the whole rather longer; subgenital plate longer, with its more compressed distal portion surpassing the apex of the supra-anal plate by a distance subequal to half the length of the latter structure, instead by less than a third of the same as in *i. indica*. Cephalic and median femora somewhat shorter and appreciably stouter than in the same sex of *i. indica*. Caudal femora slightly thicker and deeper than *i. indica*.

Allotype.— ♀; same data as type. [Academy of Natural Sciences of Philadelphia.]

When compared with a typical female from the Ledo Road, Assam, the present individual shows the following noteworthy differences.

General form, as in the male sex, somewhat robust, rather more fusiform as seen from the dorsum. Head with much the same difference in outline as in the male sex; fastigium with the greatest breadth at the ocelli similarly subequal to the fastigial length distad from the eyes, instead of slightly longer than the proximal width (as 12 to 11) as in the female of *i. indica*, low sinuosity of lateral margins of the fastigium as in *i. indica*. Pronotum slightly broader, with the greatest breadth caudad across lateral lobes to greatest pronotal length as 46 to 58, as opposed to 41 to 51 in the same sex of *i. indica*; medio-longitudinal carina of dorsum subobsolete, not as evident as in the female of *i. indica*. Tegmina and wings falling appreciably short of the apex of the abdomen.[52] Cerci with their apices slightly more attenuate, the whole narrower in proportion to length; ovipositor valves thicker and heavier, less attenuate as seen from dorsum. Cephalic and median femora slightly shorter and somewhat heavier than in females of *i. indica*. Caudal femora slightly deeper proportionately than in females of the nominate subspecies.

[52] In the paratypic female this difference is less evident, but in that specimen while the tegmina are longer, the abdomen has been considerably telescoped, the latter being more normally extended in the allotype, thus the apparent difference is more evident than real. The proportion to the apices of the caudal femora is much the same in both specimens, i.e. the tegminal apices falling short of those of the femora by a distance subequal to the fastigial length.

Measurements (in millimeters)

	Length of body	Length of pronotum	Length of tegmen	Length of caudal femur
♂, Chieng Mai, N. Thailand, *type* ..	25.0	6.5	14.9	14.6
♀, Chieng Mai, N. Thailand, *allotype*	37.2	9.7	19.2	18.0
♀, Chieng Mai, N. Thailand, *paratype*	34.0	9.9	22.0	18.2

Coloration.—The material of this subspecies is identical in coloration with that of *i. indica* which has not been altered in any way by desiccation. The allotype has several stains on the tegmina and caudal femora which are clearly not part of a pattern, and doubtless are of postmortem character. The paratypic female shows a very few, much smaller ones of the same sort on the tegmina, while the type is immaculate in this respect. The antennae are purplish gray (complete only in the allotype).

Material examined: 3; 1 ♂, 2 ♀.

NORTHERN THAILAND: Chieng Mai; I, 15—III, 1, 1933; (DeSchauensee-Sinkler Expedition); 1 ♂ (*type*), 2 ♀ (*allotype* and *paratype*); [A.N.S.P.].

Tagasta marginella (Thunberg)

1815. *T[ruxalis] marginellus* Thunberg, Mém. Acad. Imper. Sci. St. Pétersbourg, V, p. 265. [♂ (ex Stål); no locality.]

MALAY STATES: Stapak, Kuala Lumpur; VII, 1921: (G. H. Corbett); 1 ♀.

SUMATRA: Belawan, Deli District; VII, 5, 1939; (E. H. Helwig); 3 ♂, 1 juv. ♂.

JAVA: Depok; IV, 28 and VIII, 8, 1920; (Karny); 3 ♂, 2 ♀.

None of the material here reported shows any intimation of a sutural tegminal edging of reddish, or any dorsal wash of the same tone on the dorsum of the pronotum, such as mentioned by Stål in his redescription of Thunberg's type,[53] except for several of both sexes from Depok.

The Belawan material shows no noteworthy differences from the Kuala Lumpur female. The latter specimen was determined by Dr. Uvarov, and was received in exchange from the British Museum (Natural History).

OMURA Walker

1870. *Omura* Walker, Catal. Derm. Salt. Brit. Mus., III, p. 503.

1876. *Protomachus* Stål, Bihang K. Svenska Vetensk. Akad. Handl., IV, (5), p. 53.

GENOTYPE: *Omura congrua* Walker.

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[53] Recensio Orthopt., I, p. 13, (1873).

The above synonymy was established by I. Bolívar in 1905.[54]

Omura congrua Walker

1870. *Omura congrua* Walker, Catal. Derm. Salt. Brit. Mus., III, p. 504. [♀ [not ♂ as stated]; Pará, Brazil (type locality); Amazon River; Archidona [, Ecuador].]

1876. *P[rotomachus] depressus* Stål, Bihang K. Svenska Vetensk, Akad. Handl., IV, (5), p. 54. [♀; Peru.]

1911. *Omura congrua* var. *brunneri* Bruner, Ann. Carnegie Mus., VIII, p. 42. [♂, ♀; Demerara [= Georgetown], British Guiana.]

Uvarov examined Walker's original material, corrected the latter's error on the sex,[55] which is fully obvious from the measurements given, and selected the female from Pará, Brazil as the single type.[56] The synonymy of Stål's *depressus* was established in 1905 by I. Bolívar,[57] while it is evident from the material now before me that Bruner's variety *brunneri* has no status, and that individual variation covers all its supposed features.

The extensive representation before me furnishes more detailed information on the distribution of the species, and the genus, than was previously available.

Venezuela: Rio Mato; X-XI, 1909; (M. A. Carriker, Jr.); 1 ♂; [A.N.S.P.].[58] British Guiana: Demerara [=Georgetown]; 1 ♀; [A.N.S.P.]. Bartica; IV, 8-30, V, 1-25, 1901; (R. J. Crew); 16 ♂, 5 ♀; [A.N.S.P.][59]: XII, 9 (juv.), 18-23, 1912, I, 16-31, 1913, II, 6-18, 1913, III, 18, 1913 (juv.), IV, 5, 1913: (H. S. Parish); 17 ♂, 4 ♀, 1 juv. ♂, 2 juv. ♀; [A.N.S.P.]. Kartabo, Bartica District; (W. Beebe); 8 ♂, 4 ♀, 6 juv. ♀; [N. Y. Zool. Soc. and A.N.S.P.]. Kalacoon; 1916; 1 ♂; [N. Y. Zool. Soc.]. Dunoon; IX, 1, 1914; (F. M. Gaige); 1 ♀; [Mus. of Zool. Univ. Mich.]. Kaieteur; VII, 31, VIII, 11, 1911; (Crampton and Lutz); 1 ♂, 1 ♀; [A.M.N.H.]. Surinam [=Dutch Guiana]: V-IX; 1 ♀; [A.N.S.P.]. Brazil: Pará, State of Pará; VI, 19 and 21, VII, 20-30, and VIII, 4 (juv.), 1919; (H. S. Parish); 5 ♂, 3♀, 1 juv. ♂; [A.N.S.P.]: (C. F. Baker); 1 ♂;

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[54] Boletín R. Soc. Españ. Hist. Nat., V, p. 25.

[55] I. Bolívar in 1905, and the present author in 1909, had previously pointed out that Walker was in error in his sexing of the original material.

[56] Trans. Entom. Soc. London, 1924, p. 283 (1925).

[57] Boletín R. Soc. Españ. Hist. Nat., V, p. 215.

[58] This specimen, the sole one recorded so far from the Orinoco drainage, was reported by Roberts in 1937 (Proc. Acad. Nat. Sci. Phila., LXXXIX, p. 352).

[59] Reported by Rehn (Proc. U. S. Nat. Mus., XXXVI, p. 110 (1909)).

[A.N.S.P.].[60] Peixe Boi, east of Pará, State of Pará; XI-XII, 1907: (H. B. Merrill); 1 ♀, 2 juv. ♀; [A.N.S.P.].[61] Igarapé-assú, State of Pará; VI, 27 and VII, 26, 1919; (H. S. Parish); 1 ♂, 2 ♀; [A.N.S.P.].[62] Prata, State of Pará; VII, 25, 1919; (H. S. Parish); 1 juv. ♂; [A.N.S.P.]. Obidos, State of Pará; 1 ♂; [A.N.S.P.]. Manaos, State of Amazonas; (Mann and Baker); 1 ♀; [A.N.S.P.].[61] Teffé, State of Amazonas; II, 4, 1920; (H. S. Parish); 1 ♂; [A.N.S.P.]. PERU: Iquitos, Loreto; II, 9, 1920; (H. S. Parish); 1 ♀; [A.N.S.P.]. Puerto Inca, Rio Pachitea; (C. Spencer); 2 ♀; [M.C.Z. and A.N.S.P.]. ECUADOR: Alpayacu, elevation 3600 feet; 1 ♀; [A.N.S.P.].

This extensive series, which covers the present known range of the species, exhibits a considerable degree of plasticity in size, and to some extent in surface sculpture, none of which appears to have geographic correlation. The two females from Puerto Inca, Peru have the fastigia slightly longer cephalad of the eyes, but the series from the Peruvian Amazonian region is too limited to determine whether this is purely individual or geographic. If the latter should prove to be the case Stål's name *depressus* would be available.

Representative individuals from various areas, as well as the extremes of the representations from Bartica, British Guiana, and the Pará region of Brazil, measure (in millimeters) as follows:

	Length of body	Length of antenna	Length of fastigium cephalad of eyes	Length of pronotum	Greatest breadth of pronotum	Length of caudal femur
♂, Rio Mata, Ven. ...	33.0	9.4	4.0	4.8	4.0	13.5
♂, Bartica, B. G.	30.0	9.2	3.5	4.7	3.5	12.7
♂, Bartica, B. G.	32.6	9.6	3.9	5.0	4.0	13.2
♂, Pará, Pará, Brazil .	30.0	9.4	3.7	4.7	3.7	13.6
♂, Pará, Pará, Brazil .	32.0	9.7	4.0	4.7	3.9	13.2
♂, Teffé, Amaz., Brazil	29.6	8.9	3.5	4.5	3.7	12.5
♀, Bartica, B. G.	43.0	8.4	4.8	7.3	6.6	17.4
♀, Bartica, B. G.	51.5	10.5	5.2	8.1	7.6	19.0
♀, Igarapé-assú, Braz.	44.0	...[63]	4.8	7.0	6.8	16.6
♀, Pará, Pará, Brazil .	47.2	10.7	5.5	7.3	6.8	18.4
♀, Manaos, Brazil ...	44.5	9.7	4.7	7.1	6.8	16.6
♀, Alpayacu, Ecuador	45.0	...[63]	5.3	7.4	7.6	18.4
♀, Puerto Inca, Peru .	50.0	...[63]	6.1	8.4	7.9	18.9

[60] Recorded by Rehn (Proc. Acad. Nat. Sci. Phila., 1913, p. 86 (1913)).

[61] Recorded by Rehn (Trans. Amer. Entom. Soc., XLII, p. 282 (1916)).

[62] Recorded by Rehn (Proc. Acad. Nat. Sci. Phila., 1918, p. 169 (1918)).

[63] Antennae damaged or lacking.

MINORISSA Walker

1870. *Minorissa* Walker, Catal. Spec. Derm. Salt. Brit. Mus., III, p. 503.
1884. *Phymaptera* I. Bolívar, Anales Soc. Españ. Hist. Nat., XIII, pp. 23, 62.

GENOTYPE: *M. pustulata* Walker.

The synonymy of these names was established by I. Bolívar in 1905.[64] The nearest relatives of the genus are clearly *Deraspiella* on one hand and *Omura* on the other, both of which genera are now before me. Geographically it occupies an area in which no other member of the subfamily is known to occur.

Minorissa pustulosa Walker (Plate V, figs. 45-48.)

1870. *Minorissa pustulosa* Walker, Catal. Spec. Derm. Salt. Brit. Mus., III, p. 62. [♀ [not ♂]; [65] Columbia [error for Colombia]; Venezuela.[66]]
1884. *Phymaptera jucunda* I. Bolívar, Anales Soc. Españ. Hist. Nat., XIII, p. 62. [♀; Porto Cabello [, Venezuela].]

VENEZUELA: Puerto Cabello, Carabobo; II, 9, 1940; (Pablo Anduze); 1 ♀; [A.N.S.P.]. San Esteban, Carabobo; XI, 24-XII, 20, 1939, I, 8, 16, 21 and 30 and II, 6, 1940; (Pablo Anduze) 15 ♂, 14 ♀ [A.N.S.P.]. Carretera [= Highway] Maracay to Charoní, Aragua; VIII, 29, 1937; (G. V. Berthier); 1 ♂, 2 ♀; [A.N.S.P.]. La Guayra, D. F.; (Robinson); 1 ♂; [A.M.N.H.]. Naiguata, D. F., elevation 2400 feet; VII, 23, 1939; (G. V. Berthier); 4 ♂, 1 ♀; [A.N.S.P.]. Los Canales, Naiguata, D. F., elevation 720 meters; IX, 24, 1939; (G. V. Berthier); 1 ♂; [A.N.S.P.]. Caracas, D. F.; IX, 4, 1937; (G. V. Berthier); 1 ♂; [A.N.S.P.]. Antimano, D. F.; I, 6, 1937; (G. V. Berthier); 3 juv. ♀; [A.N.S.P.]. Rio Chacaito, Miranda; 2 ♀; [A.N.S.P.]. Carretera [= Highway] Filas de Mariches, Miranda; VI, 16, 1938; (G. V. Berthier); 1 juv. ♀; [A.N.S.P.].

The synonymy given above was established by I. Bolívar in 1905 (see preceding footnote reference).

This representation is the most extensive of this genus and species which has been reported. Published records since the original description include those of a female from Colombia and male from Caracas, Venezuela reported (as *Phymaptera jucunda*) by

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[64] Boletín R. Soc. Españ. Hist. Nat., V, p. 215.

[65] Bolívar first called attention (see preceding footnote reference) to the fact that Walker described the female and not, as the latter stated, the male, and later Uvarov confirmed this from the evidence of Walker's material (Trans. Entom. Soc. London, 1924, p. 283 (1925)). Walker's description, however, makes his error obvious.

[66] Uvarov (Trans. Entom. Soc. London, 1924, p. 283 (1925)) has selected the Venezuela female as the single type, hence Venezuela is the type locality.

Karsch,[67] of certain other material from Venezuela without further data, by I. Bolívar,[68] and of a single female, said to be from the Rio Mato, Venezuela, but actually from San Esteban, Venezuela, by Roberts.[69] From the information here given, and the little with exact information contained in past literature, it seems evident that in Venezuela at least this genus and species is probably limited in its distribution to the region of the coastal Andes and the immediately surrounding areas.

Uvarov has commented upon the character of the distal margin of the prosternal tubercle, which Walker regarded as tridentate, and Bolívar termed "truncate". The present San Esteban series shows that while tridentate is the usual condition, in both sexes there is a considerable range in the exact development of the margin, which may range from really truncate (which, however, is infrequent), through a condition which shows a pair of lateral dentations with a sinuation between, and the usual tridentate type, to an opposite extreme which is quadridentate, the latter, however, in but a single specimen.

In none of the males before me do the tegmina surpass the apex of the abdomen, generally failing to reach it, while in the female the tegmina either reach to or somewhat surpass the apices of the caudal femora.

The number of raised blackish points on the tegmina varies individually in the females. There are usually a few scattered ones in the region of the humeral trunk, but the main series is in that of the anal vein, and this varies in number from as few as six to as many as ten, agreeing in number or differing by but one on the two

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[67] Entom. Nachrichten, XIV, p. 331 (1888).

[68] Boletín R. Soc. Españ. Hist. Nat., V, p. 216 (1905).

[69] Proc. Acad. Nat. Sci. Phila., LXXXIX, p. 351 (1937). By an unfortunate mix-up in copying data this specimen had its locality and date incorrectly quoted. The specimen, now before me in the Academy series, bearing Roberts' long-hand determination, is labelled "San Esteban, Venezuela, X-XI, 1910, M. A. Carriker, Jr." Carriker worked at San Esteban and on the Rio Mato in October and November, but at the former in 1910 and at the latter in 1909 (see Roberts, pp. 344 and 345). It is quite possible the correct data for the single female of *Omura congrua*, which follows *Minorissa* in the paper, was accidentally duplicated. The Rio Mato *Omura* is properly labelled in the Academy series and bears the same data as that erroneously given for the *Minorissa* female. As far as known *Minorissa* does not occur in the Orinoco drainage, of which the Rio Mato is a part.

tegmina in the majority of the individuals seen, much more rarely differing by two. In none of the male individuals is there any indication of similar raised blackish tegminal points. There are at least two size grades of these papilliform spots, one larger than the other, and usually both will be found on the same tegmen, although generally the more distal ones are of the smaller category. In no case, in the present material, are these points united into a line.

There are several color features in this species, associated with structure, which do not seem to have been mentioned in past literature. In both sexes at the proximal point of convergence of the major tegminal veins there is situated a thickened and rounded node, which is contrastingly buff colored. Also the postocular tubercles on the genae and those along the ventral margin of the lateral lobes of the pronotum, all of which are more numerous and more pronounced in the female than in the male, are similarly contrastingly buff, along with one or two similarly colored pustules linearly disposed across the middle of the lateral lobes of the pronotum and several on the pleura.

The following measurements (in millimeters) present the very considerable size range in general bulk or of parts noted in the above recorded series of adults.

	Length of body	Length of antenna	Length of pronotum	Length of tegmen	Length of caudal femur
♂, San Esteban	21.5	8.3	3.9	8.9	9.9
♂, San Esteban	23.3	9.4	4.2	10.7	10.5
♂, San Esteban	23.7	10.5	4.5	11.8	11.7
♂, Naiguata	27.2	...[70]	5.3	13.3	14.0
♀, San Esteban	35.8	10.5	7.8	22.8	15.8
♀, San Esteban	45.3	...[70]	8.3	23.9	16.1
♀, San Esteban	37.8	10.7	8.8	23.7	18.4
♀, Carretera Maracay to Choroní	24.7[71]	10.5	8.6	25.2	17.4
♀, Rio Chacaito	37.0	...[70]	8.1	25.2	17.1

[70] Lacking or incomplete.

[71] Abdomen greatly retracted.

DERASPIELLA I. Bolívar

1884. *Deraspis* I. Bolívar, Anales Soc. Españ. Hist. Nat., XIII, pp. 23, 61. (Not of Blanchard, 1945.[72])

1905. *Deraspiella* I. Bolívar, Boletín R. Soc. Españ. Hist. Nat., V, 216. (To replace *Deraspis* I. Bolívar.)

GENOTYPE (by monotypy): *Deraspis volxemi* I. Bolívar.

Deraspiella volxemi (I. Bolívar)

1884. *Deraspis volxemi* I. Bolívar, Anales Soc. Españ. Hist. Nat., XIII, p. 62, pl. I, fig. 6. [♀; "Probablemente de América".]

1909. *D[eraspiella] volxemi* I. Bolívar, Genera Insectorum, Acrididae, Pyrgomorphinae, p. 42. (Combination.)

BRAZIL: Anapolis, Goyaz; (G. B. Fairchild); 1 ♀; [M.C.Z.].

This is the first specimen of this genus and species which has been recorded since the original description, and the first for which any definite locality has been given. Dr. Fairchild has been kind enough to send me some valued notes on the locality at which this specimen was collected, and which, with his permission, I am happy to be able to place on record.[73]

When compared with Bolívar's original description and single figure the present individual agrees fully, but I am here presenting two photographs of it to supplement the original illustration, which in some respects is relatively sketchy. Unfortunately the present specimen, like the type, has been decolored by wet preservation, and the original coloration has been completely destroyed, but there has been no shrivelling, and the following comments are given to

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[72] Hist. Ins., II, p. 54. (Coleoptera.)

[73] "The town of Anapolis is in the Planalto region of Brazil, long. 48°, 52′, 50″ W., lat. 16°, 10′, 30″ S., and at 1000 metres elevation. It lies about 40 klms. south of the watershed between the Paraná-La Plata and the Araguaya-Amazon drainage systems, being on a small tributary of the Rio Corumbá. The country is rolling and open for the most part, with belts of moderately heavy forest along the streams (Gallery forest) and occasionally more extensive areas of somewhat lighter forest. Palms, heliconias and aroids are almost absent and bromeliads scarce. The climate on the whole is rather temperate, the year being divided into a pronounced wet and dry season. May to August inclusive are generally without rain and are the coolest months of the year. The rains begin sometime in September, rise to a peak in November and December, slack off in January and rise to another peak in April. The annual range of temperature is from about 50° C. to about 36° C., though according to local information there are occasional light frosts. The annual rainfall is about 125 cm." Dr. Fairchild was in Anapolis for about a year in 1935-36.

amplify in certain respects the original description and the later generic one in the Genera Insectorum.

Short albo-pilosity mentioned by Bolívar absent from the dorsal surface and restricted to the venter and the limbs. Interocular area of head and occiput with several low more lateral longitudinal carinulae in addition to the medio-longitudinal carination. Pronotum with its dorsal surface transversely tectate, dorsal surface of caudal portion of prozona with short supplementary, rather irregular, longitudinal carinulae between the median and lateral carinae; lateral portions of the border of the caudal extension of the pronotal dorsum, as seen from above, evenly arcuate to the acute apex, the lateral carinae marked to a point half way between the principal transverse sulcus and the caudal pronotal apex. Tegmina with the longitudinal venation numerous and closely placed. Prosternal tubercle strongly transverse, transversely compressed, its distal margin shallowly sinuate; broad mesosternal interspace cuneiform in outline, narrowed caudad by the internal amplification of the mesosternal lobes, caudal breadth of the interspace but seven-tenths that cephalad. Supra-anal plate elongate lanceolate, twice as long as proximal breadth, shallowly tectate in transverse section, dorsad with a medio-longitudinal sulcation in proximal three-fourths, this regularly broadening proximad and defined laterad by rounded but low subcariniform borders, the apical section slightly decurving as seen in profile;[74] ovipositor jaws very appreciably compressed, apices rather strongly curved as seen in profile; subgenital plate with its distal margin concavely excised ventrad of each ventral ovipositor jaw, the inter-valvar process acute, disto-lateral angles of margin of plate rounded obtuse.

In size the present specimen is nearly or quite identical with the measurements of the species originally given by Bolívar.

It is quite probable that the genus will be found to be limited to, or at least have as the center of its distribution, the old eastern tableland of Brazil, which beyond question has long served as an evolutionary center for many diverse elements of the Neotropical fauna.

Explanation of Figures

(All natural size)

Plate I

Fig 1.—*Prosphena scudderi* I. Bolívar. Male. Cantarranas, Honduras. Dorsal view.

Fig. 2.—*Prosphena scudderi* I. Bolívar. Male. Cantarranas, Honduras. Lateral view.

[74] This latter conceivably may be due to desiccation, but that is not certain.

Fig. 3.—*Prosphena scudderi* I. Bolívar. Female. Cantarranas, Honduras. Dorsal view.
Fig. 4.—*Prosphena scudderi* I. Bolívar. Female. Cantarranas, Honduras. Lateral view.
Fig. 5.—*Cawendia hebardi* new species. Male (*type*). Elisabethville, Belgian Congo. Dorsal view.
Fig. 6.—*Cawendia hebardi* new species. Male (*type*). Elisabethville, Belgian Congo. Lateral view.
Fig. 7.—*Cawendia hebardi* new species. Female (*allotype*). Elisabethville, Belgian Congo. Dorsal view.
Fig. 8.—*Cawendia hebardi* new species. Female (*allotype*). Elisabethville, Belgian Congo. Lateral view.
Fig. 9.—*Cawendia kibara* new species. Male (*type*). Thirty miles east of Lake Kisale, Belgian Congo. Dorsal view.
Fig. 10.—*Cawendia kibara* new species. Male (*type*). Thirty miles east of Lake Kisale, Belgian Congo. Lateral view.
Fig. 11.—*Cawendia kibara* new species. Female (*allotype*). Thirty miles east of Lake Kisale, Belgian Congo. Dorsal view.
Fig. 12.—*Cawendia kibara* new species. Female (*allotype*). Thirty miles east of Lake Kisale, Belgian Congo. Lateral view.

PLATE II

Fig. 13.—*Parapetasia* (*Parapetasia*) *femorata* I. Bolívar. Male. Ebolowa, Cameroons. Dorsal view.
Fig. 14.—*Parapetasia* (*Parapetasia*) *femorata* I. Bolívar. Male. Ebolowa, Cameroons. Lateral view.
Fig. 15.—*Parapetasia* (*Parapetasia*) *femorata* I. Bolívar. Female. Ebolowa, Cameroons. Dorsal view.
Fig. 16.—*Parapetasia* (*Parapetasia*) *femorata* I. Bolívar. Female. Ebolowa, Cameroons. Lateral view.
Fig. 17.—*Parapetasia* (*Parapetasia*) *calabarica* new species. Female (*type*). Oban District, Southern Nigeria. Dorsal view.
Fig. 18.—*Parapetasia* (*Loveridgea*) *ulugurensis* new species. Male (*type*). Vituri, Uluguru Mts., Tanganyika. Dorsal view.
Fig. 19.—*Parapetasia* (*Loveridgea*) *ulugurensis* new species. Female (*allotype*). Vituri, Uluguru Mts., Tanganyika. Dorsal view.
Fig. 20.—*Parapetasia* (*Loveridgea*) *impotens* (Karsch). Male. Amani, Usambara Mts., Tanganyika. Dorsal view.
Fig. 21.—*Parapetasia* (*Loveridgea*) *impotens* (Karsch). Female. Amani, Usambara Mts., Tanganyika. Dorsal view.

PLATE III

Fig. 22.—*Parapetasia* (*Loveridgea*) *impotens* (Karsch). Male. Amani, Usumbara Mts., Tanganyika. Lateral view.
Fig. 23.—*Parapetasia* (*Loveridgea*) *ulugurensis* new species. Male (*type*). Vituri, Uluguru Mts., Tanganyika. Lateral view.
Fig. 24.—*Parapetasia* (*Loveridgea*) *ulugurensis* new species. Female (*allotype*). Vituri, Uluguru Mts., Tanganyika. Lateral view.
Fig. 25.—*Parapetasia* (*Loveridgea*) *impotens* (Karsch). Female. Amani, Usumbara Mts., Tanganyika. Lateral view.
Fig. 26.—*Parapetasia* (*Parapetasia*) *calabarica* new species. Female (*type*). Oban District, Southern Nigeria. Lateral view.
Fig. 27.—*Maura bolivari* Kirby. Female. Limbe, Nyasaland. Female. Dorsal view.
Fig. 28.—*Maura bolivari* Kirby. Limbe, Nyasaland. Female. Lateral view.
Fig. 29.—*Deraspiella volxemi* (I. Bolívar). Anapolis, Goyaz, Brazil. Female. Dorsal view.
Fig. 30.—*Deraspiella volxemi* (I. Bolívar). Anapolis, Goyaz, Brazil. Female. Lateral view.

PLATE IV

Fig. 31.—*Pyrgomorphella rubripennulis* Key. Male. Port Elizabeth, Cape Province, South Africa. Dorsal view.
Fig. 32.—*Pyrgomorphella rubripennulis* Key. Male. Port Elizabeth, Cape Province, South Africa. Lateral view.
Fig. 33.—*Pyrgomorphella rubripennulis* Key. Female. Port Elizabeth, Cape Province, South Africa. Dorsal view.
Fig. 34.—*Pyrgomorphella rubripennulis* Key. Female. Port Elizabeth, Cape Province, South Africa. Lateral view.
Fig. 35.—*Pyrgomorphella angolensis* new species. Male (*type*). Palavange, Angola. Dorsal view.
Fig. 36.—*Pyrgomorphella angolensis* new species. Male (*type*). Palavange, Angola. Lateral view.
Fig. 37.—*Pyrgomorphella angolensis* new species. Female (*allotype*). Palavange, Angola. Dorsal view.
Fig. 38.—*Pyrgomorphella angolensis* new species. Female (*allotype*). Palavange, Angola. Lateral view.
Fig. 39.—*Tagasta indica indica* I. Bolívar. Female. Ledo Road, Assam. Dorsal view.
Fig. 40.—*Tagasta indica indica* I. Bolívar. Female. Ledo Road, Assam. Lateral view.

PLATE V

Fig. 41.—*Tagasta indica mutata* new subspecies. Male (*type*). Chieng Mai, northern Thailand. Dorsal view.

Fig. 42.—*Tagasta indica mutata* new subspecies. Male (*type*). Chieng Mai, northern Thailand. Lateral view.

Fig. 43.—*Tagasta indica mutata* new subspecies. Female (*allotype*). Chieng Mai, northern Thailand. Dorsal view.

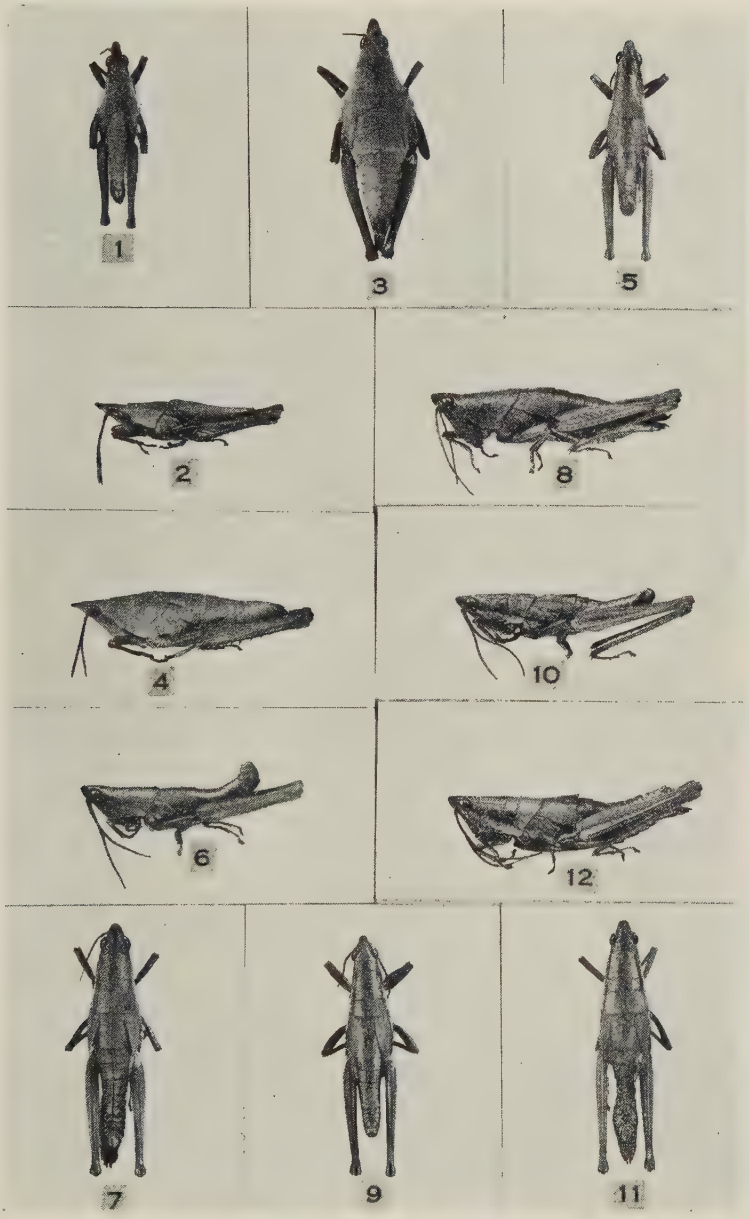
Fig. 44.—*Tagasta indica mutata* new subspecies. Female (*allotype*). Chieng Mai, northern Thailand. Lateral view.

Fig. 45.—*Minorissa pustulosa* Walker. Male. San Esteban, Venezuela. Dorsal view.

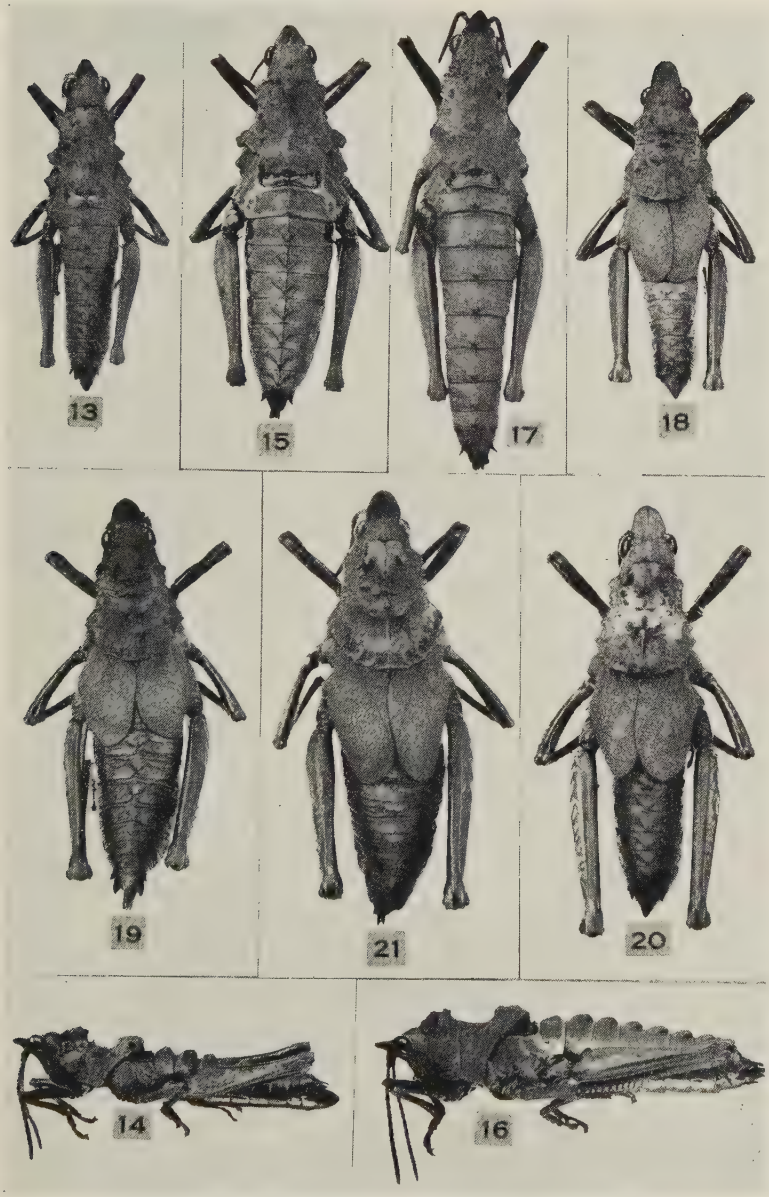
Fig. 46.—*Minorissa pustulosa* Walker. Male. San Esteban, Venezuela. Lateral view.

Fig. 47.—*Minorissa pustulosa* Walker. Female. San Esteban, Venezuela. Dorsal view.

Fig. 48.—*Minorissa pustulosa* Walker. Female. San Esteban, Venezuela. Lateral view.



REHN—RECORDS OF PYRGOMORPHINAE



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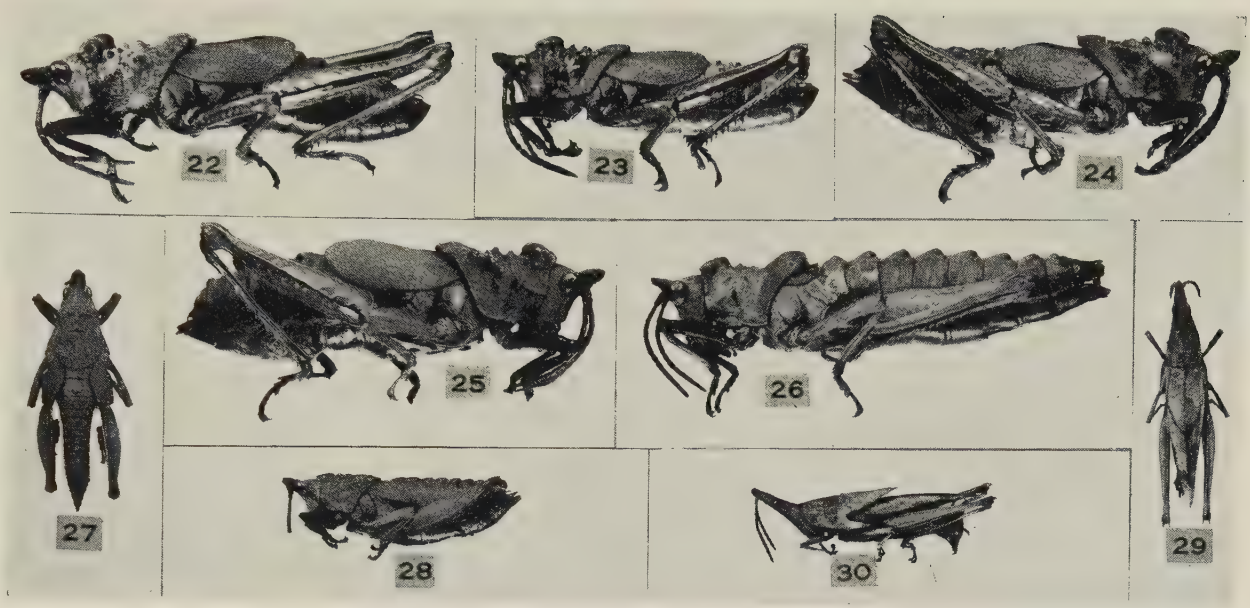

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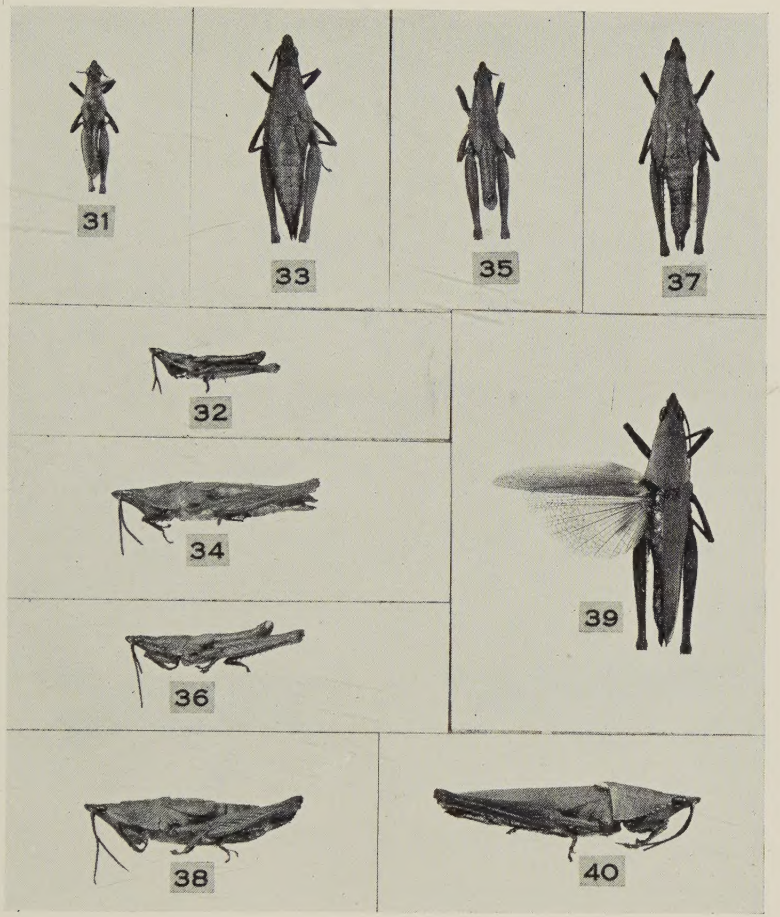

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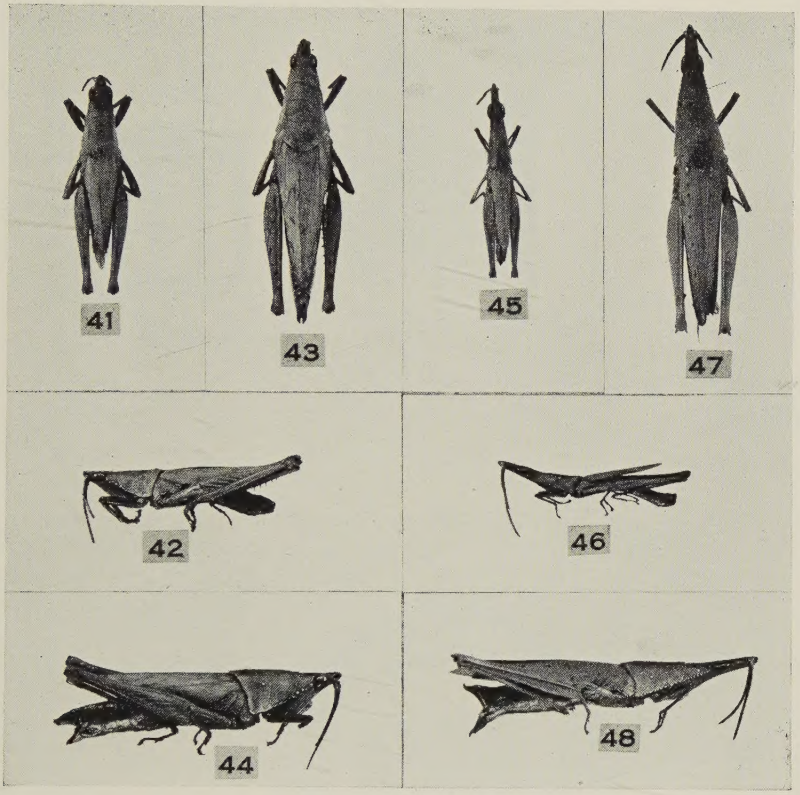

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